THE Federal Accountant

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NATIONAL SYMPOSIUM ISSUE

Changing Dimensions of Financial Management in the Federal Government

VOL. XI DECEMBER 1961 NUMBER 2

Published by the Federal Government Accountants Association in co-partnership with The George Washington University

FEDERAL GOVERNMENT ACCOUNTANTS ASSOCIATION

BASIC PURPOSES AND OBJECTIVES

- To unite professional accountants in the Federal service for constructive endeavors.

- To encourage and provide a means for free interchange of ideas among accountants in the Federal service.

- To aid in the improvement of accounting and auditing in the Federal Government.

- To contribute to the improvement of education in the field of accountancy, with emphasis on the application of accounting and auditing to the activities of the Federal Government.

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A Publication dedicated to the improvement of financial management in the Federal Government

THE *Federal Accountant*

VOLUME XI, NUMBER 2, DECEMBER 1961

PUBLISHED QUARTERLY, IN SEPTEMBER, DECEMBER, MARCH AND JUNE OF EACH FISCAL YEAR, BY THE FEDERAL GOVERNMENT ACCOUNTANTS ASSOCIATION IN COSPONSORSHIP WITH THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS OF THE GEORGE WASHINGTON UNIVERSITY

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Government has pioneered in the use of electronic data processing, probably the most revolutionary management tool of our era, and still leads business in this important field. Chairman Macy reviews the rapidly evolving changes in financial management within the Federal Government and points to the broadened responsibilities thrust upon accountants, budget personnel and auditors with the Federal Government's increased reliance upon computers and scientific concepts of management.

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Opinions and beliefs expressed in THE FEDERAL ACCOUNTANT are those of editors or contributors and do not necessarily reflect the views or policies of the Federal Government Accountants Association and its committees, the George Washington University and its faculties, or Government Agencies with which these individuals may be associated. Contents of THE FEDERAL ACCOUNTANT are indexed in The Accountants' Index and in the Tax Institute Bookshelf.

THE Federal Accountant

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Editorial

Our New Look

This issue of THE FEDERAL ACCOUNTANT is the first to be published from its new National Publication Office at The School of Government, Business and International Affairs of The George Washington University in Washington, D. C. With the Federal Government Accountants Association, The George Washington University thus as a public service becomes cosponsor of THE FEDERAL ACCOUNTANT but exercises no control over editorial policy or contents. THE FEDERAL ACCOUNTANT will be under the guidance of its editorial staff, but its character will be fashioned by you, its readers and its contributors, and from you necessarily must come whatever may be needed to establish its preeminence among professional journals.

With this issue also we have joined forces with Judd and Detweiler, Inc. Printers, to process THE FEDERAL ACCOUNTANT in Washington under arrangements compressing our printing leadtime from four months to one month. Countless times in the past quality and currency was influenced by the inflexibility of a four-month leadtime. The shorter leadtime now achieved will permit greater currency in our publication and the more expeditious response to comments from readers that is essential in a publication meeting the highest standards of journalism.

For many years we have shared with readers generally a great pride in THE FEDERAL ACCOUNTANT and in the quality and dignity of its appearance. Progress however requires change, and numerous changes in format are being introduced in this first issue of THE FEDERAL ACCOUNTANT published under the new cosponsorship. These improvements have been under study for more than a year and represent the best composite of the various recommendations submitted in the fall of 1960 by the different chapters of the Association. We believe these changes considerably improve THE FEDERAL ACCOUNTANT and we sincerely hope you will like "Our New Look."

You undoubtedly have noticed already the new cover design and colors. The reversal of the prior colors was in response to opinions that the cover was too easily soiled in handling. The new design was adopted to feature highlights of the issue. Inside you probably already have found the summary of contents which henceforth will appear at the front of each issue. You also may already have noted several of the new departments which will appear regularly. One of these, Reader Opinion, will provide a ready forum for exchange of reader

views. Another, Government and Industry, also makes its first appearance in this issue and two others are well along in the planning stage: Foreign Developments in Financial Management, and Problem Clinic or Problem Forum. New departmental formats, judicious use of pictures, expanded biographical sketches of authors and more extensive use of varied type faces are other modifications that modernize appearance and enable the journal otherwise to better serve its readers.

The two regular departments which have appeared through the years will continue in each quarterly issue but their scope and coverage have been expanded and the departments renamed. Inside Government, the former Technical Accounting Developments, will deal with programming, budgeting, accounting, financial reporting and auditing activities in the central fiscal and operating agencies. It will now be possible to highlight the more significant developments in Federal financial management for the benefit of our readers. Similarly Professional Reading, the former Current Publications, will cover in depth a wider variety of articles, pamphlets and books of professional interest to those engaged in financial management.

The new Government and Industry department will provide a continuing coverage of a particularly vital aspect of modern life—the impact of government upon the business community. Regulatory and tax phases of accounting in the Federal Government have been limited in THE FEDERAL ACCOUNTANT, but now an especially distinguished group of officials from key Regulatory Agencies of the Federal Government are cooperating with Norman L. Burton, Editor-in-Charge of the Department, to provide important new material. Mr. Burton, whose biographical sketch appears on page 4, has had extensive experience at responsible levels in business and government and is exceptionally well qualified to deal impartially with the many issues characteristic of this field of government endeavor.

To attempt more than to mention general objectives for the two new departments still in the planning stage would be premature. The prospective department dealing with accounting, auditing and related financial management developments at the central government level in foreign countries will be aimed at keeping readers informed generally of what is being done elsewhere. There is much to be learned from the experiences of other countries and a compendium of the differing practices in other countries should prove most stimulating. The other prospective department is aimed at exploring in depth problems submitted by our readers and through this means possibly suggest various alternatives of practical help in their search for solutions. Answers and other comments will be from knowledgeable sources, and while they will carry no authority other than that provided by their inherent reasonableness, they will represent the personal opinion and thinking

of individuals who, by virtue of their positions and experience, influence financial management developments and progress.

New departments are not the only means which will be used to expand our coverage of membership interests. A larger number of articles than in the past will appear in each of the quarterly issues, making possible a much more complete coverage of the range of membership interests. This is our basic charter and improved service is our primary objective. It is our ambition to make THE FEDERAL ACCOUNTANT more current, more stimulating, more comprehensive, more membership-oriented, and we hope most sincerely, more effective in its contribution to improved financial management in the Federal Government.

About Your Editors

Each of the editors of THE FEDERAL ACCOUNTANT has long been identified with the Federal Government Accountants Association and its activities. All have extensive experience in financial management in the Federal Government and all have an intense interest in the objectives to which the Federal Government Accountants Association and THE FEDERAL ACCOUNTANT are dedicated. With but one exception, all are active members of the Federal Government Accountants Association, two being charter members. The non-member editor, Professor A. M. Hillhouse of Cornell University, served five years as a member of THE FEDERAL ACCOUNTANT Advisory Board at Cornell University and is internationally recognized as a leader in the field of public administration and finance.

MR. LEWIS,
Executive Editor

The Executive Editor, Edwin J. B. Lewis, is a charter member of the Federal Government Accountants Association with 19 years of Federal experience in responsible accounting, budgeting and general controllership capacities. Mr. Lewis, a former Vice President of the Washington Chapter, has served on numerous Washington Chapter and National Committees of the Association and for the past five years was Chairman of the National Editorial Committee which supervises the editorial policies for Association publications. Mr. Lewis currently is Professor of Accounting at The George Washington University where he specializes in Federal Accounting and Federal Budgeting courses developed to meet the needs of financial management personnel in the

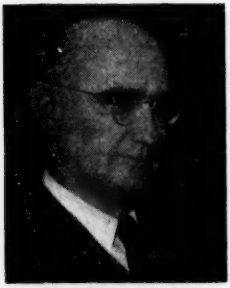
Federal Service. Mr. Lewis's professional affiliations include the American Accounting Association, the American Economic Association, the American Statistical Association and the National Press Club.

The consulting editors share with the Executive Editor in the resolution of general editorial questions and hence are equally involved in all major matters affecting THE FEDERAL ACCOUNTANT. Each consulting editor also specializes in a particular functional area in order to provide for an equitable distribution of effort among the editorial staff.

MR. BURTON,
Army Audit Agency

Consulting Editor Burton, with eighteen years of high level experience in accounting, auditing and other areas of financial management in the Government, is in the Office of Professional Services, U. S. Army Audit Agency. He has been active in the Federal Government Accountants Association since 1950, was Secretary for three years, and has served on numerous committees at chapter and national levels. A certified public accountant of Illinois and Washington, he has also had extensive experience in public accounting and education. He is a member of the American Institute of Certified Public Accountants and the American Accounting Association.

Mr. Burton's primary area of specialization relates to articles on government and industry relationships. In addition he serves as Editor-in-Charge of the new Government and Industry Department, which makes its initial appearance in this issue, and as Advertising Director of THE FEDERAL ACCOUNTANT.



DR. HILLHOUSE,
Cornell University

Consulting Editor Hillhouse, a distinguished accountant, educator and author, has had extensive Federal Service as Budget Officer of the National Housing Agency during part of World War II; as Chief, Public Finance Branch, Military Government for Austria and from 1948 to 1951 as Chief, Public Finance Branch, under the High Commissioner of Germany. Mr. Hillhouse currently is Professor of Public Administration in the Graduate School of Business and Public Administration at Cornell University and conducts courses in governmental accounting and fiscal management. Dr. Hillhouse was a member of the research staff of the National Committee on Governmental

Accounting for preparation of the Standard Classification of Municipal Revenues and Expenditures and has served as consultant to: the Finance Division, New York State Department of Social Welfare; the Comptroller of the State of New York; and the Housing and Home Finance Agency. He also has been a staff member of the President's Commission on Intergovernmental Relations.

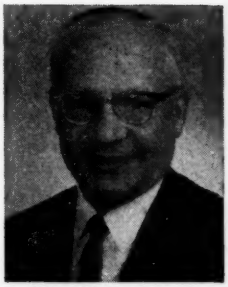
In addition to his general and specific responsibilities as a consulting editor, Dr. Hillhouse will lend his invaluable aid as Editor-in-Charge of the Foreign Financial Developments Department of THE FEDERAL ACCOUNTANT, a field with which he is eminently familiar. Developments in government elsewhere will be dealt with through appropriate articles and through this new department which will soon appear as a regular feature.

MR. HOFFMANN
Federal Aviation Agency

Consulting Editor Hoffmann, a certified public accountant of the District of Columbia and Texas, has had more than twenty-five years of responsible auditing experience, some twenty years of which have been in the Federal Service, including assignments as Navy Cost Inspector, Acting Supervisory Cost Inspector for the Eighth and Ninth Naval Districts, Audit Manager, U. S. General Accounting Office and Deputy Director, San Antonio Region, U. S. Army Audit Agency. He is presently Regional Auditor for Federal Aviation Agency's Southwest Region. Long active in the Federal Government Accountants Association, Mr. Hoffmann was National Vice President in 1960 and 1961 and formerly was President of the San Antonio Chapter. Other professional affiliations include the American Institute of Certified Public Accountants and the American Accounting Association.

Mr. Hoffmann will serve in dual capacities with THE FEDERAL ACCOUNTANT. In addition to his functional area of consulting editorship specialization, which is auditing, he will also serve as Circulation Manager. In this latter capacity, he is responsible for directing THE FEDERAL ACCOUNTANT's circulation drive which is being carried on in conjunction with the local chapter committee efforts on an Association-wide basis.

Consulting Editor Teitelbaum is widely known to members of the Federal Government Accountants Association as "Mr. Statistical Sampling" because of his outstanding contributions in interrelating sampling and auditing. Mr. Teitelbaum is a staff advisor to the Auditor General of the U. S. Air Force on statistical sampling and



MR. TEITELBAUM,
Air Force

related techniques in Air Force auditing activities. His service in the Federal Government has been continuous since 1934 and includes varied positions in civilian and military agencies. His projects for the Government have included studies of statutory and regulatory audit requirements; functions, organization and staffing structure of auditing offices; audit procedures and techniques; and of course the statistical sampling projects for which he is so well known. Mr. Teitelbaum's efforts in behalf of THE FEDERAL ACCOUNTANT will be devoted to the broad field of management science. This field embraces operations research, statistical sampling and all other systematic approaches to more effective management.

MR. WALLING,
General Accounting Office

Consulting Editor Walling, a charter member, has been an editor of THE FEDERAL ACCOUNTANT since 1956. His service in the Federal Government began in 1934 and includes experience at both central fiscal and operating agency levels. Now with the General Accounting Office, he has been closely associated with the Joint Financial Management Improvement Program and its forerunners since 1941. Mr. Walling has held numerous offices in the Federal Government Accountants Association, including Director of Research, 1952 to 1954, and Washington Chapter Secretary 1954 to 1956. A certified public accountant of Texas, Mr. Walling has had teaching experience in Texas and Washington, D. C. To his already full schedule of activities, Mr. Walling will add specialization in the area of Financial Reporting under THE FEDERAL ACCOUNTANT's expanded program. His past experience with the journal has already proven to be most helpful to the new members of the editorial group.

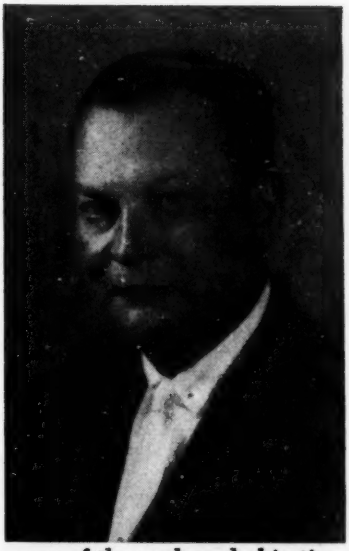
Responsibility for day-to-day guidance of your periodical necessarily rests with its editors. Any editorial staff is most effective, however, when it functions as the agent of the publication's readers and contributors. The editors of THE FEDERAL ACCOUNTANT thus act for you in molding it into an instrument that will reflect your views, your interests and your professional aspirations.

PROGRAM FOR 1962

Our Goals and Objectives This Year

James A. Robbins

President
Federal Government Accountants Association



In my recent travels, I have been impressed with the stature the Federal Government Accountants Association has attained in its brief existence. Although a little over ten years old, the progress made in contributions to better financial management in Government has been tremendous. Today we are recognized as one of the foremost accounting professional organizations in the country. However, we cannot afford to sit idly by and bask in this new found glory. If we are to continue to gain prestige in and out of Government we must continually work at it. In my message to the membership upon assuming the office of National President, I stated that at a later date I would set forth some of the goals and objectives I would like to see the Association achieve during the current year. These do not necessarily represent new or original ideas, but rather areas which in my view require continuing priority attention.

Today our membership numbers approximately 4,200. I believe we have merely scratched the surface in terms of attracting qualified financial managers into our Association. There are many thousands of Federal employees currently engaged in occupations which qualify them for membership. We must make every effort to tap these unexplored sources of membership so that the FGAA will be truly a representative financial managers Association. Our goal for the current

fiscal year is to attain a membership of 5,000. I am convinced that, with a little concerted effort, this goal can be reached. If each of us would make an attempt to bring a new member into the Association, our goal would be easily achieved.

The latest statistics of the Civil Service Commission indicate there are 62 cities in the United States with more than 5,000 Federal employees. We have FGAA chapters in 27 of these cities. This leaves 35 cities with sizable numbers of Federal workers in which a FGAA chapter has not been established. Recent experience indicates that a little promotional effort can bring amazing results in terms of a newly organized chapter. It is our goal to bring into the FGAA fold not less than five new chapters by the end of the current fiscal year.

The trade-mark of a successful professional organization is often a dynamic research program. FGAA has recently issued its first research bulletin on statistical sampling. I might add that we are the first of the professional organizations to issue a bulletin on the subject. This indeed is a milestone in the Association's life. At the present time we have several additional projects in research. We hope some of these will result in bulletins before the end of the year. Chapter research committees must make their contribution if our research program is to be a success. We solicit the support of all chapters in this program.

In order to be successful, a professional organization must be truly representative of its membership and must voice the views and opinions of the majority of the membership in everything it does. Ways and means must be found to permit the members outside of Washington to have a more active voice in the management of FGAA. I believe a revised method of electing our vice presidents might do this. Plans are presently in process to present to the membership an amendment to the bylaws which would authorize a regional vice president type of organization. I think this might provide a more effective method for Association management and contribute to greater solidarity among all chapters.

Today there is a crying need in our universities and colleges for more courses on Government accounting, auditing and financial management. Many of today's college graduates are either entering Government service or the employ of an industrial concern heavily engaged in Government contracting. Under either set of circumstances, their college education should include courses in Government financial management. I urge all chapters to accelerate their activities with local colleges and universities by offering assistance in establishing appropriate Government financial management courses. I have found that our colleges and universities welcome this assistance. Perhaps the day is not too distant when a textbook sponsored by the

Association will be in use in colleges and universities throughout the country.

The prestige of FGAA certainly has been enhanced by the seminars jointly sponsored by FGAA chapters and other professional organizations. Most of our sister professional organizations are only too pleased to participate in this type of activity. These cooperative ventures not only have educational benefits, but they afford the opportunity for our friends outside of Government to learn more about us. I strongly urge our chapters to make and retain continuing contacts with the leaders in other professional societies in their area.

The voice of FGAA is THE FEDERAL ACCOUNTANT. We are working hard to make this one of the finest publications in the land; however, we need your help. Your assistance is needed in increasing our circulation and in the contribution of articles for publication. We would like each member to become a salesman, your prospective customers being universities, university students and industry. How good a salesman are you?

Of course each year we strive for the best Annual Symposium ever held, and this year will be no exception. The Symposium will be held at the Sheraton Hotel, Philadelphia, Pennsylvania, May 28, 29, and 30, 1962. The theme will be "New Concepts and Techniques for Financial Management." We expect to have a program that will be somewhat different and of interest not only to our membership but also to universities and industry. Hope to see you in Philadelphia.

In conclusion, I hope you will forgive me for philosophizing a bit. Frequently, the outsider has a suspect view of anyone who receives his pay from Uncle Sam. Why, I have never been able to understand. As a group dedicated to duty, we do not fear comparison. We would like to think of Government service as an honor, not a right; a privilege, not a haven for incompetents who fear competition. FGAA, through its efforts to achieve improved financial management in Government, can also be the instrument for telling the true story of the average civil servant—thus hastening the day when Government employment will carry with it the true respect it deserves.

John W. Macy, Jr.

Changing Dimensions

Ever broadening challenges of management, together with the revolutionary new electronic tools in which our Government has pioneered, make it possible for accountants, budget personnel and auditors to make their full contribution to solution of the massive and myriad problems inherent in the direction of the nation's public business.

It is a special honor you offer when you give a non-accountant the opportunity to open your conference. You also assume some risk when this offer is made to a fellow staff man—a personnelist—noted for a lack of terminal facilities when it comes to keynotes. But I take pleasure in this opportunity to speak to you on the occasion of your first conference since the present Administration took office. This permits me to explore with you the current management revolution in which financial managers have played so significant a part in the development and control of public programs.

They tell me at the Commission that I am still too young to reminisce, but in much less than half a working career we have witnessed enormous changes in management philosophy and even more vivid ones in the concepts and methods of financial management. Back in 1941 James Burnham startled his readers with forecasts of a "managerial revolution," but his prophesy was all too modest in the terms you know so well.

The "Changing Dimensions of Financial Management in the Federal Government" are illustrated better by the titles of your conference sessions than by anything I could say in keynote remarks. Very few of these subjects could have been on a program even ten years ago. Vast progress has been made in financial management in the ten years since this Association was incorporated—progress to which the Federal Government Accountants

Association has conspicuously contributed. And the greatest changes are yet to come.

Less than ten years ago, in October 1951, in a speech before the Controllers' Institute in New York, Joseph B. Jeming said, "How soon the first complete electronic accounting system can be seen depends not on the business machine companies, and not on the engineers, but on the controllers themselves. One thing is certain: the first electronic accounting system which goes into operation anywhere will start the revolution in every accounting office. . . ."

Government Leadership

Government was far ahead of business in the use of electronic data processing back in 1951, and it is still in the lead. Government has pioneered computer application and continues to pioneer it. Federal officials you will hear in this symposium are the leaders, not the followers, in the development of complex, large-scale applications of technology to assist management in reaching critical public decisions.

A brief review of the historical growth in automatic data processing gives us proper perspective on Government leadership.

The UNIVAC which General Electric put into operation at Louisville, Kentucky, in the summer of 1954 was the first of these systems in business, but the first large-scale fully automatic business data processing system was delivered to a U. S. Government agency, the Bureau of the Census in, 1951.

MR. MACY

John W. Macy, Jr. is Chairman of the United States Civil Service Commission. Mr. Macy first entered Government service as a participant in the administrative intern program sponsored by the National Institute of Public Affairs and served in increasingly responsible positions (including three years of military service) in a number of agencies until 1958 when he resigned his position as Executive Director of the United States Civil Service Commission to become Executive Vice President of Wesleyan University. He held the latter post until his appointment as Chairman of the Civil Service Commission early in March of this year.

By the end of 1957, 121 electronic systems for data processing had been installed in Government agencies. By 1957 almost every major activity in Government having large-scale paperwork and record-keeping functions had been affected in some degree by the introduction of electronic systems. Today there are over 700 computer systems operating in thirty Government agencies.

John Pfeiffer, in his book titled "The Human Brain," states that we need computers because we have developed ways of living too complicated for our brains to cope with. The needs, tasks, and responsibilities of big management have become so large and complex that they are no longer understandable or manageable without the aid of the modern computer. The conclusion is that the complex circuitry and design of the computer are necessary to simplify life in management. Just as thousands of years ago man learned to use simple hand tools and mechanical devices to help him better cope with his environment, we have had to develop new methods to cope with the complexity of the mid-twentieth century environment.

Electronic data processing is only one example of the new methods and concepts crowding in upon us. The scope of Government operations demands leadership in developing these new ways. It demands that we understand and make use of each new concept and practice that will help us do a better job.

Tides in Management Approaches

The rapidity of change is best illustrated by the fact that in less than half a century we can see three tides in the development of management, each one overtaking its predecessors and leaving its mark.

First of these was the era of "Scientific Management," which placed a premium upon functional specialization according to a careful analysis of the one best way to do a job. A hallmark of scientific management was the fractionating of supervision and the separation of planning and control from the actual conduct of operations. It was an era of emphasis on devices to assure compliance. The ascendancy of machine-model scientific management over individual artisanship was expressed in industry in the formation of the great Detroit assembly lines. In Government

this thinking could be seen in emphasis on centralization and uniform practices—in the Budget and Accounting Act of 1921, which led to the important establishment of the Bureau of the Budget.

The 1921 Act represented a major revision in the whole budgetary procedure. It disposed of the pratice whereby each agency came to Congress on its own and it focused upon an increase in Presidential control over finanicial planning. For the first time we had a national budgetary system. On the audit side we also saw the requirement of centrally prescribed and relatively uniform accounting and review systems. The General Accounting Office actually kept the books of the Post Office Department until 1950.

Another administrative revolution was being generated even before the techniques of scientific management were in full flower. The work of Elton Mayo and his followers gave impetus to the participative management philosophy. It was realized that the release of productivity and the success of programs were dependent upon the involvement of people in goals and methods. Management's interest again turned to decentralization and the placing of responsibility for results at the locus of operations.

The 1940's witnessed the development of concepts underlying the Budget and Accounting Act of 1950, which decentralized responsibility for financial management to agencies under general guidelines prescribed by the central agencies. These general guidelines permitted variation in practice to meet the needs of management in each agency, while they retained the element of consistency with central review. Although the term "financial management" did not come into general use until 1953 or 1954, I was exposed to some of the earliest uses of the new concept during my own experience at the Atomic Energy Commission in the late 1940's.

Now we are on the threshold of a new wave of managerial advance in which we will draw heavily upon a new concept of science in management. Contributions by mathematicians, statisticians, industrial engineers, and such social scientists as psychologists and economists, are converging to provide new approaches to solving intricate management problems. We are finding new

ways of thinking about the handling of information. We employ the capabilities of electronics both in the rapid communication of data and in its manipulation.

We are thus in a position to bring more testable data to bear upon problems and to simulate solutions. While historical data will continue to be important for knowing what has happened, so that adjustments in direction can be made, managers are increasingly in need of predictive information. The concepts of operations research and the other " optimization" techniques have enhanced management's judgment by sharpening various alternative courses of action available to them, including the interrelated "penalties" and benefits accruing to each course.

The ability to obtain current, accurate, and meaningful information of the most comprehensive sort is yesterday's dream come true for those who carry the day-to-day administrative responsibility.

Requirements for Effective Management

There are, however, certain aspects of administrative responsibility which we must constantly pursue if we are to make the most of the new era of science in management. First is the importance of the growth of the manager in vision—sensitivity to and awareness of the emerging issues and problems both of the contemporary scene and of his organization, to which the decision apparatus—technical as well as human—is to be applied. The apparatus of decision can contribute to this awareness by providing information on trends, but the necessary questions will not occur all by themselves. Answers are revealed only to him who asks questions.

Second, we must not be misled into believing that by the analysis of *available* information we discharge our responsibilities. We must learn how to search out the information we need and not gear ourselves to going through a vast set of motions to produce a predetermined product. In financial management this may mean the development of new and different accounting and statistical data for management decisions.

Third, we must learn how to digest the wealth of data which our new technology makes possible and present it to the fast-

moving manager in a form pertinent to his needs. William A. Gill of the Bureau of the Budget has said that "Perhaps the greatest educational challenge we face is not directly associated with the ADP program, but is an outgrowth of that program. It concerns the problem of educating management in how to determine what it needs to know to manage effectively, how to secure the data needed, and how to use the data effectively." This involves a responsibility on the part of management to make its concerns known and the corresponding obligation on the part of all management's staff functions to respond to the problems which require executive action—and to do so in terms of the problems which confront management. The task will be to translate information generated in technical and program terms into management issues.

Participation in New Developments

You here today have an opportunity to grow and progress with the new developments in managerial thinking. Your realization of the necessity for change—for growth—and of the implications of the new thinking for financial managers is well recognized in the content of this farsighted symposium. Your determination not only to keep up with progress but to create it is equally well reflected by the other activities, purposes, and aims of this Association, such as:

(1) Your greater stress on education to benefit the individual members with their diversified interests and to strengthen their base for growth in contributing to the missions of their agencies;

(2) Your increased attention to research in the problems, developments, and practices of financial management to help establish improvements and disseminate information to members;

(3) Your interest in expanding your publications activities; and

(4) Your desire for closer ties with the universities and colleges with respect to curricula in relation to the educational requirements of, and opportunities in, Federal financial service so as to encourage the entry into Federal service of more highly trained and qualified accountancy graduates.

These goals properly recognize that even in this era of greater

machine use the prime resource in this professional field, as in every other, is the individual man and woman. The human capabilities must harness technology to meet Government's program demands for human progress. In the development of this capability we can continue to work collaboratively on a variety of common projects.

Assistance in Training Institutes

The Civil Service Commission has enjoyed the benefits of close association with officers and members of the Federal Government Accountants Association over the past several years in which we have conducted training institutes in the field of financial management. Our initial effort in this field, undertaken in 1958 in cooperation with the Joint Financial Management Improvement Program, provided Federal employees working in financial management areas with an opportunity to survey the state of financial practice under Public Law 863 of 1956. This was followed last year by additional institutes dealing with the interrelationships of the financial management functions.

This year we have already conducted an institute for financial managers of the future on topics dealing with the communication between financial management and general management. A very harmonious and complementary balance exists between that institute and the topics of your symposium. Later this year, as part of the interagency training conducted by our Office of Career Development, we plan to conduct a conference for senior financial managers as well as programs for line officials who have an interest in updating their knowledge in your field of interest.

Your Association has played a most helpful part in providing us with resources for conducting these programs, and I wish to acknowledge this help on this occasion. At the same time, I would like to underscore the importance of the educational function served by such professional associations as yours as we move into the space age, with its enormous demands for education and training. The colleges and universities will not be able to provide us with all the well qualified professionals we need, and we will have to continue to find new ways to develop the necessary competence.

Assistance in Delineating Career Patterns and Position Standards

The Civil Service Commission has recognized the importance of strength in the profession by working closely with the Federal Government Accountants Association in delineating career patterns and directions. More order and logic have been introduced into the once-blurred occupational lines in Government financial management. Purely clerical jobs have been identified and segregated. The new occupation of Accounting Technician was created for positions above the clerical level but not requiring full professional abilities. The new occupation built flexibility into the occupational structure—so that people could be hired and assigned in terms of both their abilities and the requirements of the jobs.

New standards now sharply define professional accounting positions, but they also provide an educational equivalency test to insure that non-college trained accountants can aspire to these positions without diluting the profession. There remains much more to do, but these accomplishments make it possible for both management and employees to see clearly appropriate and feasible career patterns. They will help achieve a truly professional breed of financial managers, together with the necessary supporting technicians, which we all seek.

Broadened Responsibilities

The day is gone when financial people had to be satisfied with the narrow and restrictive scope of responsibility only for compliance and legality. The new developments which began with the introduction of the concepts of accrual accounting and cost budgeting demand responsibility for entirely new financial functions. The ever broadening challenges of management, together with use of the new tools explored in this symposium, make it possible for accountants, budget personnel and auditors to make their full contribution to solution of the massive and myriad problems inherent in the direction of the nation's public business.

Management cannot make decisions independent of the costs of carrying them out. Management must have every kind of cost data which can be furnished them:

Historical data for accomplishing traditional control of ongoing programs,

Critical analysis leading to maximum economy and efficiency in the use of resources, and

Imaginative processes for developing alternative choices of action and the total costs involved—for sharpening the issues at stake in managerial decision-making.

Our combined objective of achieving the maximum economy and efficiency in the use of resources in behalf of public programs is strongly emphasized by President Kennedy. In speaking to the Regional Commissioners and District Directors of the Internal Revenue Service early this month, he said, "I think it is our responsibility to make sure here in the National Government that every dollar that is collected by the Internal Revenue Service, every dollar that is paid by our people, is spent wisely, for a useful national purpose, for a purpose which advances our national interest."

For every one of you here that is a very significant message, for I think it is true that in every Government agency we are all called on to undertake new responsibilities and new workloads without a corresponding increase in resources.

Broadened financial functions require broader financial managers—financial managers with the positive and imaginative outlook, the depth of experience and training across specialty lines and the understanding of interdisciplinary skills, which will assure the technical wisdom and management leadership we so urgently need today.

David A. Woellner

Data Processing Requisites and Their Application

As data processing becomes an ever more important factor in modern accounting practices, no accountant can afford not to be thoroughly familiar with these indispensable requisites for effective data processing applications.

Proper planning, proper control and proper measurement techniques are fundamental in data processing. They vitally affect the accountant working within the organization and the accountant functioning in the role of external auditor. Regardless of how he approaches data processing, or from what organizational perspective he approaches data processing, the accountant must first establish the existence of these fundamentals before he can proceed with his administrative or auditing program.

Planning

In planning the feasibility study is of paramount importance. How well organized it is and how well documented it is can make or break the computer installation.

During the course of the feasibility study there are three important determinations to be made, all in specific and quite minute detail:

1. *The management objectives to be reflected in the data processing plan.* Although the objectives for data processing are broadly those that exist for the organization as a whole—they do not exist in separate worlds—these objectives must be defined in terms of specific policies and the latitude within these policies must be known.

2. *The specific procedures and policies which will be affected by data processing.* These particularly must be documented in

very minute detail to provide, among other things, a firm base for comparison between the "before" and "after" situations.

3. *The costs of the data processing procedures relative to current costs.* Accurate cost determination is difficult but important and should include all direct, measurable, budgeted costs.

These determinations represent fundamentally what might be called a minimal planning effort. The more experienced organizations generally expand this minimal planning to include such additional topics as systems integration, which is a subtlety of systems planning, and the greater use of the exception principle, another subtlety of systems planning.

A phase often overlooked in feasibility analysis is one best termed the "hard dollar approach." All too frequently organizations allow themselves to become enmeshed in a massive data processing program without any recognition of the cost impact. They get so excited over intangibles—better inventory control, better reports, better this or better that—they fail to realize until too late their costs have gone up, say, $120,000 or more. The dollar approach is as much needed in data processing as it is in evaluating the soundness of new capital equipment in a manufacturing plant. Investing in electronic equipment is much like investing in a new milling machine, where that all important test is universally recognized to be essential: Can it return tangible dollars on the investment made?

If all these factors are effectively interwoven in the formal data processing plan, one of the most significant requisites for a success-

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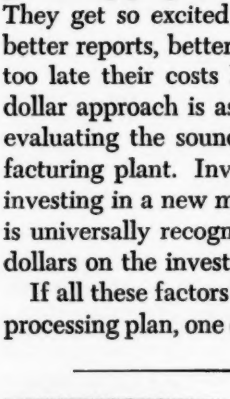

MR. WOELLNER

David A. Woellner, of Ernst & Ernst, has had more than 17 years of diversified experience in the fields of management controls, systems planning and applications of integrated data processing techniques. An industrial management graduate of the University of Cincinnati, Mr. Woellner has been responsible for the successful completion of integrated data processing applications in banking, manufacturing, distribution and processing industries in the United States and abroad. He has written and lectured frequently on these subjects and has successfully supervised large systems and data processing staffs for major industrial corporations.

ful program will have been achieved. It should be recognized, however, that only the highlights of planning could be covered in a discussion this brief and that many other considerations may be involved. These of course vary with the particulars of the individual organization but all of the basic factors mentioned must be there and they must be there in such a fashion that they can be measured and evaluated against subsequent performance.

Control of Input and Output

The importance of adequate control over computer operations is so obvious that the number of data processing centers in complete chaos because this elementary requirement has been ignored is surprising.

Control over input is one of the keystones of computer success and effective input control usually is a very simple process. In most cases it amounts to nothing more than batch control with "hash" totals. When Department A, for example, sends a group of documents to the data processing center, it should establish by formal record that there are 450 documents in the group (batch control) and that the serial numbers of these documents total 10,032 ("hash" total). Control can be this simple. It becomes a little more complicated, but not unduly so, when the data processing center absorbs some of the clerical processing that properly is a line activity of this Department A which is forwarding the 450 documents. A data processing center inherently is an independent service activity established to perform a tangible function for the entire organization. A service center may absorb some of the functions, but it cannot properly absorb any of the responsibilities, of the departments in services. Some of the problems encountered in practice result from a failure to appreciate this distinction. Although these problems can have rather far-reaching ramifications, they are never insurmountable.

Control over output is no less essential, because data processing unfortunately is not without error. The equipment itself and the people operating the equipment are both subject to error and a data processing center must of necessity edit its output for reasonableness before releasing to the using department any of the reports involved.

Housekeeping within the data processing center likewise should be regarded as an element of control. One of the first things an auditor looks for in evaluating a computer installation is the apparent level of general housekeeping. Are cards stacked around hit-or-miss on tabulators or sorters? Do the operators replace the master files in the proper storage area after use? Are loose cards in evidence? Do operators carry cards in their shirt pockets? If any such deficiencies are noted, the overall controls are regarded as suspect. Then there are the more basic questions of whether operating procedures exist in writing and whether the operators are trained in their use. These may seem elementary but experience proves them to be of great practical importance.

Audit Control

The controls over input and output documents serve also as basic audit controls but the auditor must go beyond these in his audit program. Probably the most troublesome area for the auditor is his review of computer programming. This matter of program review is of considerable concern to professional accounting and auditing organizations today because programming can so easily get out of control. A simple program modification to meet new requirements can completely disrupt audit procedures if made at a critical time. During the critical phases of an audit, the auditor must of necessity control the program physically to make sure the program being reviewed is not altered.

Auditors have a further responsibility: to verify the control features of the program itself. To do this they must evaluate both what is built into the equipment in the way of machine accuracy checks and also what is programmed into the equipment. Machine accuracy checks designed into a machine cause it to verify automatically its own mathematics and its own operations. Since the specific methods used in machine checking vary with the manufacturer, the auditor needs to study the individual characteristics of the equipment involved in the audit. Additional controls are normally incorporated into the program in the form of instructions which cause the machine first to develop appropriate summary and related subsidiary totals and then to make comparisons for consistency.

In special audits, auditors often have to develop specialized audit programs to cover specific objectives. They need to know whether various reports are feasible and if so how to produce them. They also must be able to design special test decks and test programs to verify any new runs being made as part of their audit procedure.

The emergence of the smaller computers has given renewed impetus to the whole concept of audit controls. Auditors now have to recognize that an entirely new dimension has been added to audit activity and must take steps to become skilled in the use of these new techniques. The same holds true also for accountants working within the organization.

Workload Leveling

Control of machine utilization represents a third major area of importance in the data processing environment. Data processers are capable of speeds and feeds in much the same manner as is a milling machine. Each piece of processing equipment has a rated capacity and a lower normal effective utilization which is something less than 100 per cent of the available hours. Two factors account for this lower normal effective utilization. First, there are the inevitable random, nonscheduled breakdowns that occur no matter how thorough the preventive maintenance program may be. Secondly, and of probably greater importance, there has to be capacity to do special-request type of work. It is quite practical, however, to load each and every machine systematically and in so doing obtain excellent measures of operator efficiency. With machine loading, workload leveling becomes possible—balancing out the workload so that there is a more even flow of work within the data processing center.

The techniques of workload leveling are quite simple. They are based on the written instructions previously mentioned, wherein major operations are identified for each program. These operations can be reduced to terms of running time for operators and machines. Key punch efficiency is also a factor and can be readily measured in terms of key strokes per hour. In a rather large data processing center, with 125 persons on a three-shift basis, very effective workload leveling and control procedures were operated

with only about three hours of key punch time and three hours of sorting and listing time monthly. Effective measurement procedures are not expensive and pay off tremendously in the increased understanding they provide of workload currently in the center and how it would be affected if new tasks were added.

A Practical Application

These requisites were applied with considerable success in administering the systems and data processing efforts of a large multiplant corporation which had more than 35 different data processing centers within its organization. The general magnitude of the computer operations of this corporation is indicated by the fact that about $10 millions a year was involved in direct wages and machine rentals for its computer centers. These centers were controlled centrally but, with one exception, were decentralized both as to operation and administration. Centralized control was exercised to keep operations from getting out of hand and was vested in an organization of three branches: Data Processing Planning and Control; Administrative Procedures; and the Corporate Data Center.

The functions assigned to Data Processing Planning and Control are of particular interest in that they involved:

- Developing and administering a program to obtain the maximum utilization, service effectiveness and economy of operations in all of the corporation's data centers.
- Approving the acquisition or disposition of any hardware by the corporation.
- Developing and administering a corporation-wide data processing plan, which had as its objectives the following:
    a. Reduction of data processing expense.
    b. Creation of greater data processing capacity.
    c. Systems integration.
    d. Systems improvement.
    e. Improved management control through the more timely presentation of decision-type information.

These functions were of course very carefully coordinated with both Administrative Procedures and the Corporate Data Center.

At the start of the program it was decided to begin with the engineering and production phase. In production, schedules of finished goods required were the point of departure for all planning. In this particular instance plant schedules were being established for each plant six months in advance and the schedules were being revised monthly. This was done manually on an exception basis for all of the plants and for all of the products and all of the product variations involved. Even with the 450 clerks being used in the manual operation, there still were too few clerks to do more than merely plus or minus once an initial pass had been made at estimating end-product sales.

One of these manually scheduled production programs was accepted for the initial data needed in the data processing application. The total input of course had to include all of the individual parts and components that went into the numerous end items. These were picked up by end item or by some subassembly of an end item. This particular process posed a tremendous problem, as anyone having any familiarity with the christmas-tree breakdown of a bill of material will appreciate. The process had to start at the engineering level and underwent some minor automation but came to the data processing center largely as a manually prepared document. The third significant category of data involved in this program was the established standard cost for each of the parts involved. There were in the total product line about 30,000 individual parts that broke down into some 5,000 assemblies and some 750 major assembly groups. The various minor variations possible in this product mix would number in the hundreds of thousands if not in millions.

These three data categories—the schedules, the part lists identified by end use, and the standard costs—were processed through a central computer to create:

- A complete production bill of material, replacing the inordinate clerical effort involved previously in rearranging the parts with all their variations into bills of material for the products of each of the manufacturing plants, carried through all supplying and final assembly levels.
- Matching standard costs for direct labor and material.

- Detailed production schedules by plants, with each schedule divided into five significant reporting phases.
- Detailed shipping schedules for supplying plants and outside vendors.

Every one of these major documents previously had been manually prepared. With the new procedures any one of them, or for that matter any of the minor schedules as well, could be changed almost instantaneously. For example, as the sales emphasis shifted by region and by product, it could be detected and the supply lines altered via data processing to make certain the products are available where and when needed.

Perhaps the most interesting development which came out of this application was an ability to establish effective work-in-process inventory control at plant level for all of the plants involved in the system. Through data processing, work-in-process inventories actually were reduced by over $25 millions—something that could not have been done other than by sheer guess prior to data processing. Billing, accounts receivable, and surplus and obsolescence controls completed the package of procedures involved.

There will be many intermediate stages by which this program evolves to maturity but ultimately the company will be able to prepare its sales forecasts, convert these into production schedules, ship the product, cost it, invoice the customers, maintain inventory control and accommodate all the adjustments therein entirely through electronic data processing means. Already in the less than four years of its existence the program has saved its costs many times over.

Use in Operations Research

In too many instances operations research is treated as a mere toy for mathematicians who enjoy mathematics for its own sake. Operations research can be a very powerful tool when reinforced with computer techniques and directed towards the problems of an organization. For example, the computer capabilities which have just been described are also being used to considerable advantage in plant location studies, to provide answers to such questions as, Should Plant No. 9 be located in Atlanta, Georgia,

in Bangor, Maine, or where? This effort has not been completely finite because currently only transportation and tooling cost can be measured with accuracy. All of this is leading ultimately, however, to a very sophisticated management control system which might be described as "forward cost control," wherein anticipated future tooling costs, future sales and future production costs all will be tied together in a single system of cost and budgetary control.

Another operations research application that cost about $12,000, largely for systems and programming effort, produced inventory savings of $2.3 millions. The machine time required in this project was nominal, amounting to 45 minutes a month for the three runs required. The area selected for this cost reduction project was the service parts function, involving six major warehouses, 600 wholesalers, 4,500 dealers, and 35,000 different parts. In the preliminary review it became apparent that all 35,000 parts couldn't be handled effectively, so it was decided to concentrate on those parts which accounted for 80 per cent of the sales, or 2,100 parts. Two basic formulas were employed—one for sales forecasting and another for inventory control—and each formula was correcting of itself and of each other. It was found that for each $50 increase in inventory backorders would be reduced by $1. The $50 increase was considered too costly to be worthwhile but the general approach of relating inventory levels to backorder volume was adopted as a significant measure of performance. The $2.3 millions reduction in inventories achieved through computer techniques did not, it should be added, result in any increase in the out-of-stock or backorder situation.

This experience in service parts sales forecasting and inventory control was applied time and time again in other areas and invariably produced good results. Never once, however, were the formulas shown to management. Instead, the presentations to management were made in terms of inventory levels and backorder status and management was assured that each case could be proved by test runs on the computer and by test samples. This sufficed for policy determination and relegated the technical details to the technicians, where they belong.

One of the more recent projects grew out of a request from the controller and treasurer for help from a systems perspective in evaluating the potential of acquiring a possible wholly-owned subsidiary. This possible subsidiary had a specific mission that was quite different from the corporation's own basic mission. After some analysis it was felt that assistance could be provided by mathematically simulating the operations of the subsidiary. Discussions with the operating management led to a determination that there were 77 major independent variables involved in the subsidiary's operations, too many to handle other than by formula. A formula was therefore developed to establish a mathematical relationship for the 77 variables, so that any of them or any group of them could be varied and the effects measured. The computer was then programmed to forecast quarterly balance sheets and income statements for the subsidiary and no matter how the variables were mixed the conclusion was the same: an unsound investment.

Technically this project was much more complex than any of the many engineering problems programmed for the computer. The time required to program it was about one half of a man-year and the results obtained sufficed to convince management conclusively they could not afford to make the investment. Management said, "Thank you very much, you have answered the problem. Accordingly, we will not invest in this company."

Evolution of the Systems Concept

These various applications were all built against a framework of proper planning, proper control and proper measurement techniques. They were not built without some errors in judgment. It was necessary on occasion to go back and rebuild but out of this sound experience came a sincere respect for the importance of these techniques. The requisites for data processing apply to areas that must be studied and evaluated whether the accountant's relationship to data processing is one internal within the company or external in the capacity of independent auditor.

What will be the evolution of these different applications that have been described? Unquestionably it will be still further in the direction of the total systems concept. Integration concepts

will be applied more extensively and the eventual outcome is likely to be a network of satellite data centers with a major central computer. Need for better data transmission techniques is the only thing now holding back this particular program. Ultimately satellites will perform the operational day-to-day type of processing, the central computer will perform the analytical management report functions, and there will be a proper cross-feed between the two, with the central computer serving as backup to all of the satellites.

ON GOVERNMENT EMPLOYMENT AND SPENDING

I am especially desirous that new programs or expansions of existing programs be undertaken with caution and deliberation, to make sure that sound criteria are used, careful plans are laid and minimum funds are spent.

I much prefer that obligational authority remain uncommitted where there is any doubt that expenditures would yield substantial returns to the national interest.

I am also especially desirous that the number of government employees be limited to the minimum consistent with getting the job done. There is no question that employment can be held substantially below the levels which would be possible under the funds authorized by the Congress, if strong efforts are made to achieve increases in productivity and efficiency, to use better techniques of management and production, and to staff each activity with only the minimum number of employees needed to carry out our objectives.

. . . President Kennedy in a statement at an October 1961 Cabinet meeting

Clifford E. Graese

Auditing Electronically Processed Data

Over the past decade auditing has been relatively little affected by electronic data processing. Recent advances necessitate major modifications in conventional auditing procedures and the auditor can no longer escape the impact of computer systems. The nature of these new challenges is explored from the point of view of both the external and the internal auditor.

Electronic computers have been a factor in accounting and auditing for about ten years. The first five of these years were spent largely in making feasibility studies and in planning systems and procedures preparatory to the delivery of computer equipment. The second five years probably are best characterized as a period of experimentation with computers, for to date few companies have reached the point of fully integrated applications.

In retrospect these years have contributed much to the future of electronic computers, including a widespread appreciation of the realities of computer operations. Most computer users found that data handling problems outside the computer area require much more attention than was contemplated originally. They found that management often is unable to define clearly and specifically the information it actually needs or desires from the computer system. And they found also that programming, rather than being a one time cost, is actually a continuing cost because of changes in procedures or hardware, optimization of routines and various other factors. These developments now have come to be recognized as important computer realities of the present-day environment.

Auditors likewise have gone through a series of different phases during this ten-year period. In the early stages many auditors

were involved primarily in assisting with feasibility studies. Having as yet no actual experience in auditing computers, the auditor's concepts were expounded in very general terms, stating either that auditing would be revolutionized within a few years or the direct opposite, that computers would have no effect upon auditing procedures. Perhaps the most vocal were the former group. However, after the initial wave of articles dealing with this subject, the auditing profession generally settled back to await the actual installation and integrated application of computers.

Renewed Interest in Computer Auditing

Although many auditing problems were anticipated, they have not materialized to any serious extent in practice to date. Because computer users generally have been very control conscious, they have provided in their systems for substantial quantities of hard copy. Thus it has still been quite possible for the auditor to conduct his audit in much the same manner as he did prior to the advent of computers.

Currently, however, a new phase of computer auditing seems to be evolving. Computer applications are becoming more integrated. Also, and of major significance, computer users are gaining greater confidence in their equipment and are beginning to curtail the volume of hard copy being produced. Auditors in turn are beginning to gain sufficient experience with the auditing

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MR. GRAESE

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of electronic computers to make a start on formulating sound new approaches to the audit problem.

The recent rekindling of interest in computer auditing is attributable not alone to the public accounting profession but also to internal auditors and various special audit groups, for example, in government regulatory agencies.

Challenges to the Auditor

Recognizing therefore the present status of computer applications and the renewed persistent interest in computer auditing, what challenges do computers pose to the auditor? Most of these would seem to fall in the area of audit trail, involving such things as machine language, sequential processing, random access, wire transmission and direct input.

Although it was impossible to read punched cards, it was relatively simple to convert them into legible hard copy. From the auditor's viewpoint, this may be a somewhat more involved task with magnetic information, particularly if it is internally stored.

Sequential processing also presents an audit trail problem. The sequential processing which is feasible with computers eliminates many of the intermediate hard-copy journals which were present in the case of punched card or manual procedures. Frequently the only hard-copy information available under a computer system is the source document and the end report in summary form, with no record available of the intermediate processing which has taken place.

Random access poses an audit challenge because with random-access computers it is no longer necessary to sort the original source data into some logical sequence. Consequently, even though a chronological hard-copy listing of data as it was introduced into the computing system may be available, it may not be usable readily by the auditor seeking to examine specific transactions.

One may anticipate an increased elimination of hard copy, with greater use of exception reporting. More likely than not, in the future hard-copy reports will not be made of all data processed, but rather only exception data will be printed out. Thus many of the records which the auditor has been accustomed to testing in

the course of his audit, or which he has reviewed to become familiar with the business activity which transpired throughout the period, will no longer be available for his inspection.

Wire transmission of data poses a further challenge to the auditor. Frequently the computer is located at one center, various data collection points are scattered throughout the country, and the final reports are assembled at still a third location. In order for the auditor to examine sufficient competent evidential material in support of the final summary statements, it is necessary for him either to visit numerous locations or to arrange in some manner for the physical transfer of source documents to the central audit point.

Further, it may be anticipated that the use of direct-input equipment will grow in popularity. At such time as this equipment is extensively applied, source documents will in many cases no longer be available, since the transaction will be recorded initially in magnetic form. Perhaps the most frequently discussed application in this area is the direct recording of hours worked by an electronically-operated time clock actuated by special encoded personnel badges.

Suggested Approaches to These Challenges

Each of these challenges posed by computers to auditors, taken by itself, certainly would not appear to be insurmountable and most auditors would be ingenious enough to devise techniques to overcome the specific problems involved. It is probable, however, that any approach to auditing electronically processed data which attempts to adapt itself to computers merely by overcoming individually each of the challenges posed is apt to be rather unsatisfactory. Instead the auditor must take a broader approach to the problem, perhaps changing many of his basic conventional auditing procedures in recognition of the new elements of control which exist, and limit his procedures to those necessary to accomplish his objectives within established generally accepted auditing standards.

It is mandatory in this new phase of computer auditing that the auditor first familiarize himself with the basic operating principles of a computer system. He must understand essentially how a

computer system operates, though this is not to say that he must be capable of actually operating or programming the equipment. He must also have a basic understanding of the accuracy and reliability of computer equipment. The degree of accuracy which can be obtained through the use of electronic equipment is very high in comparison with that generally obtained under manual systems. The auditor is entitled to take this greatly improved accuracy into account in determining the extent and scope of his audit procedures.

On the other hand, the auditor must also be aware of the inherent weaknesses of computer systems. One such weakness, specifically, is found in the possible unauthorized intervention by the console operator in the processing of data. The auditor's procedures must be based on a comprehensive understanding of the weaknesses as well as the strong points of the computer system.

Perhaps most important of all, however, the auditor must orient his concept of accounting and business systems to an electronic systems approach. The conventional segregation between accounting records, statistical records and general operating records is no longer necessary nor the most practical. The capacity of computing equipment is such that these records can now be combined into a single unified system. Frequently, therefore, the approach taken to record-keeping in data processing systems differs substantially from that followed under manual systems. Undoubtedly the auditor will be frustrated if he attempts to apply directly to such electronic systems the auditing procedures that were designed for manual or punched card procedures.

Controls Existing in Electronic Systems

Audits of electronic and manual systems are very similar insofar as the significance of internal control upon the extent and scope of audit procedures undertaken. The controls existing under electronic systems, however, are in many ways more easily delineated than those existing under manual or punched card procedures. This is a definite advantage to the auditor in auditing electronically processed data.

The controls existing in electronic systems may be divided into four basic categories:

1. Built-in controls
2. Program controls
3. Input-Output controls
4. Operating controls

1. Built-In Controls

Many controls exist in the form of internal checking devices built into the electronic circuitry of the computer by the manufacturer. Specific examples include the parity bit check, dual circuitry, and echo checks. These controls function primarily as processing controls. They serve to detect circuit or electronic failures as they occur and avoid the waiting until the end of a run for the operator to detect their occurrence by means of overall checks which exist in the system. Considerable processing time may be saved in this way through the timely detection and correction of errors. From the point of view of the auditor, these checks must be taken largely for granted and therefore they are of relatively little direct significance to the auditor. These controls may be considered primarily processing controls rather than audit controls.

2. Program Controls

Program Controls are those incorporated into the system by programming the computer to make certain checks as a part of its processing operations. Typical of these controls are the limit check, proof arithmetic, cross footing, identification check, label check and sequence check. By means of proper programming, it is possible to perform a certain amount of editing on the input and output data of a computer run. It is possible to program the computer to perform routine reviews and cross checks on data or processing results that might otherwise have to be made through additional clerical checking and overall review. These controls are designed primarily to check the accuracy of processing individual transactions and to prevent individual errors.

3. Input-Output Controls

These controls are so designated because they refer to the establishment of control totals over the total units or dollar value

of data introduced into the computer system for processing. The totals should be controlled by an independent control group and compared with the processing results or output. Generally speaking, these controls are used to detect loss of data or the insertion of additional data during the processing run. Typical input-output controls include such items as "hash" totals, record counts, predetermined dollar totals and unit totals. Also included are such control procedures as reconciliation to standard payroll or to standard total dividend amounts. While these controls constitute an overall control, they may not provide any direct control over transfers between accounts or individual transaction postings.

4. Operating Controls

Another category of computer controls relates to the actual operation of the computer system. Included here is the control established over the console operator to prevent deliberate manipulation of the records. Operator control can be established in part by special print-out routines and, in some cases, by rotation of the console operators. Suitable control also must be maintained over the tape-handling techniques in use and other procedures which might result in improper processing due to faulty operation of the equipment by its operators. A further area of concern is the type of general controls over programs in use and the master files, to prevent unauthorized or accidental modification. All the varied controls grouped under this fourth category deal inherently with deliberate manipulations or with errors resulting from physical mishandling which could require considerable reprocessing time in order to restore the records to their original accuracy. These controls can be regarded as primarily important from an operating point of view, especially if the input-output controls are adequate.

Auditor's Evaluation of Controls

At first thought it might appear that the auditor's best approach to the problem of evaluating internal control would be through direct participation in the design and installation of the system. In this manner any controls which the auditor believes should be installed in the system could be recommended at the time the procedure is being devised and thus costly changes avoided at a

later date. This type of participation is perhaps more feasible for the internal than the external auditor, although it has been advocated frequently as a highly desirable approach from the external auditor's point of view. That the approach is desirable must be conceded, but it is not a panacea because of the economics involved.

It should be recognized that controls are not primarily the concern of the auditor but of management. They affect the auditor principally in the extent of the audit procedures he must undertake. While this consideration is without doubt important, it must be relegated to a secondary position to that of management. It is vital that management satisfy itself that adequate controls exist before installing a computer system. The auditor may and perhaps often should serve as a consultant to management in this connection. In his primary role as auditor, he is not as such in a position to insist upon the inclusion of any specific control procedure in a system, but rather must evaluate the aggregate effect of existing controls in the entire system. The auditor's real concern, therefore, is that management has given adequate consideration to the problems of control.

As a practical matter, if the company's personnel are adequately trained in internal control considerations, there may be considerable duplication of effort in having the external auditor participate as a member of the programming team merely to comment upon the control aspects of the system. Further, the difficulty of later changes to incorporate recommendations for improved control procedures has probably been overemphasized. In large part the control procedures with which the auditor is primarily concerned relate, not to individual program steps within the computer program, but to peripheral controls in procedures preceding and subsequent to the computer operation.

Admittedly it is disrupting to change a procedure to incorporate changes. Nevertheless it may be preferable to utilize the auditor's efforts at a time when the procedure is about to be finalized, so that he can base his conclusions on a reasonably finished product and a review of the entire procedure. New programming techniques are making it increasingly more feasible to effect changes in the computer program at reasonable cost. Because of the

numerous reprogramming changes that seem to be required in any event, controls even now are frequently dropped or added without major difficulty in the course of program modification.

Whether or not it may be considered desirable to have the external auditor or even the internal auditor participate in the programming operations to ensure that adequate controls exist, this has not been the case in many, if not most, of the applications to date. Thus it has been necessary for the auditor to review the existing controls after the programs and procedures were established. This can be done through a review of block diagrams and control registers established for input and output control. Even after such a review has been made, it still is necessary for the auditor to satisfy himself that the program actually utilized on the computer does, in fact, conform to the procedure outlined in the block diagram.

At one time it was advocated that the only satisfactory approach to this problem was a detailed review, step by step, of the program. Actually this would not be a practical approach even if the auditing profession did have sufficient people who were competent to make such an evaluation. This approach would be too costly. Further, because of the numerous minor program changes made in the ordinary course of computer operations over a period of time, it would be necessary to repeat this detailed program review at each audit. Some have suggested, therefore, that it might be feasible to control detailed program changes as they are made but even internal auditors, who could have a day-to-day connection with the computer operation, have found that this approach is not very practical.

Instead of the detailed review procedure, there is growing acceptance of what may be referred to as the "simulated problem approach." This approach involves the development of a set of simulated transactions for which the results are predetermined. These transactions are then processed, using the existing computer program, and the results of the computer run are compared with the predetermined results. If the results agree, the conclusion is drawn that the computer program does, in fact, process the data in a proper manner. In addition to utilizing simulated problems which attempt to comprehend every feasible type of transaction,

this approach also calls for the use of transactions designed to test specifically the program controls. Transactions containing redundant data or exceeding maximum limit controls established in the program are introduced to determine that the program does, in fact, serve to detect these transactions as exceptions.

The internal auditor may, because of his more frequent audits, find more frequent use for the simulated problem deck than the external auditor. This approach is, however, equally valid for the external auditor who may visit the operations only once a year. Moreover, the usefulness of the simulated problem deck can survive minor and perhaps major program changes, since it is designed around a series of typical business transactions, which do not change in nature from day to day, rather than around specific computer program steps.

Undertaking the Audit

Once the auditor has established the degree of internal control which exists within the system, he is in a position to decide upon the specific audit procedures he will undertake in performing the audit. In performing various audit tests the auditor may consider either "going through" the computer or "going around" the computer. To go through the computer, the auditor must have considerable technical knowledge of computer operating procedures and may have to spend an extensive amount of time in preparing specific computer programs with which to process data through the computer. He also may find it extremely difficult to obtain the necessary computer time, because there rarely is sufficient unused computer time available to afford the auditor any appreciable amount of operating time. Another problem involves the retention of data in machine language form. It may be necessary for the auditor to conduct his audit on a cyclical basis within a reasonably short period of time following the period which he wishes to use as a test period.

On the other hand, going through the computer has several very distinct advantages. It enables the auditor to use the computer potential to achieve significant time savings. The scope of audit tests can be expanded considerably through use of the tremendous capacity of the computer to make correlation tests

and comparisons. Further, the use of statistical sampling techniques is facilitated. In many cases it will be found that the auditor has no alternative but to go through the computer, due to the nature of the records maintained and the form in which the data is retained.

Generally speaking, it may be said that the internal auditor will find the alternative of going through the computer to have greater potential for his audit operations than will the external auditor. In large part, this is due to the fact that he has more direct contact with the computer operations and therefore is already well versed in the programming and control techniques used. Because he is more concerned with the detail transactions and because his tests of such transactions are apt to be far more extensive than those of the external auditor, the time saving potential is far greater, particularly if special audit programs are devised.

Alternative Audit Uses of Computer

Several alternatives are available to the auditor in "going through" the computer in connection with his audit procedures. One is to devise a special audit program to be used on the computer. This approach has practical disadvantages for the external auditor, because of the substantial amount of programming time required in relation to the length of his audit procedures. It may, however, have more potential for the internal auditor because of his greater frequency of audit and more extensive testing. The simulated problem approach is a second alternative. For the reasons previously mentioned, it seems to hold the greatest potential for both the internal and the external auditor.

Another alternative is the conversion of the electronic data into punched card form and the use of punched card equipment by the auditor to perform the audit tests. Frequently this is a very practical alternative, because the extent of the auditor's tests is usually relatively limited and therefore the relatively slow speeds of punched card equipment do not pose a serious handicap. At the same time, many of the advantages of the use of computer equipment can be retained in this audit approach.

In this connection two specific cases will be cited from public auditing practice. In the first case, the initial approach was based

on using the computer to maximum extent in connection with the audit. It soon became apparent that this approach was economically unfeasible because a tremendous amount of programming time would have been required to program audit operations on the computer. A very satisfactory audit procedure was then worked out utilizing punched card equipment after converting selected data to punched cards. In the second case, the use of a simulated problem deck offered the greatest potential. In cooperation with the internal audit department, a simulated problem file was developed which, though rather limited as to number of individual transactions, was very comprehensive in scope. It is interesting to note that although the client's computer personnel had considerable reservations regarding this approach, the simulated problem deck did uncover minor deficiencies in the computer program which had not been detected previously.

Conclusion

Although experience in the auditing of electronic computers is increasing rapidly, very few completely integrated systems actually exist and computer users to date have been extremely control conscious. Thus there are many audit problems which perhaps have not been encountered to this point. Every indication gained from experience to date, however, leads to the belief that the installation of computers generally has resulted not only in improved accounting records but also in improved internal control and improved record reliability.

Modifications in the external audit program generally are necessary when a computer is installed, but many of the modifications made in practice have actually produced a more satisfactory audit than previously and the modified programs in most cases offer a potential for cost reductions in future audits. Internal audit departments also are beginning to realize some of the potentials of the computer in connection with their audit operations, particularly in the area of correlating data, which could not be done by manual means. On the balance it seems clear that the computer has already brought many advantages to the auditor, as well as to management, and the future can be expected to follow a similar course.

Robert George Bizzell

Evaluating the Programmer

An internationally developed form for evaluating programmer performance is presented, with the recommended detailed factors to be considered during the rating process.

Evaluating personnel is a problem as old as industry itself. It is perhaps the most difficult task the supervisor has to undertake because it involves a particularly touchy phase of human relations. It is moreover a task which, if not performed skillfully, can seriously disrupt the entire organization.

The evaluation of an electronic data processing programmer does not differ basically from other personnel evaluations but the standards for evaluation differ. Since the computer industry is relatively new, standards for computer operations are not fully developed. In spite of numerous articles written on the subject, and the varying methods already tried in programmer evaluation, the need for improvement still is urgent. As more experience is gained in the computer field, there will be a better basis for establishing standards which reflect realistic performance and criteria and more reliable standards can be expected.

Establishing standards in an industry in which there is little previous experience is difficult, but without standards it is next to impossible to perform an evaluation. The difficulty of establishing standards is compounded in this instance by the fact that a programmer is more than a mere clerk. He must be creative and at the same time imaginative. Both of these factors are hard to measure, and such broad evaluations as "he works hard and does a good job" or "I can't get a thing out of him" are of little value.

A programmer needs dual capabilities. He must see not only the overall picture clearly, but he must also be able to work in minute detail. Furthermore, like a camera with a Zoomar lens, he must be able to switch from one of these extremes to the other in mid-stride. A good programmer sees both the trees and the

forest. Developing standards which can measure this wide swing of ability is a difficult, yet vital, problem.

Importance of Programmer Evaluation

The question may arise as to why programmer evaluation is necessary. The answer to this is the same as the answer to the question "Why is an inventory necessary?" Management cannot make effective decisions without knowing both the quantity and quality of the stock on hand. In a very real sense programmer evaluation supplies a personnel inventory of quantity and quality. It has the added benefit of measuring programmer improvement as well as performance. In an industry expanding as fast as the computer industry, merely more adequate performance is not enough. Programmers must continually find means of improving their techniques, increasing their knowledge of the subject, and using their imagination to cope with new situations.

An effective evaluation system is needed to keep track of the programmers' output and improvement. Evaluation results can be used to determine when a programmer "does not quite measure up" and whether he can be helped by additional training; they might even indicate he is in the wrong type of employment. The system also identifies the programmer who is ready for a salary increase or other added recognition. These incentives must not be used lightly, however, or they soon lose their effectiveness.

Other major benefits are possible and should be sought. The ideal evaluation system makes the programmer responsible for

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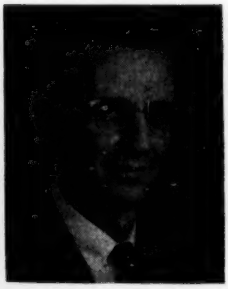

MR. BIZZELL

Robert George Bizzell is Auditor for Computer Accounting with the Southern Railway System and a member of the Association for Computing Machinery. Mr. Bizzell has been with Southern Railway since 1942 in progressively responsible positions and has had extensive systems and computer experience. He spent three years in the United States Air Force as an electronics specialist during World War II and for a number of years has been particularly active in GUIDE educational undertakings.

much of his own supervision. Since he will have had a part in setting up the evaluation methods and criteria, he knows the system will be beneficial to him and will work harder to meet the challenge. This understanding makes him more willing to accept the responsibilities of whatever job he is given and much less supervision "from the top" is required to keep him working well. Any good evaluation system will, in effect, make the programmer monitor his own work. It should also include incentives which will stimulate him to exert that "extra ounce of effort" so often needed to meet deadlines.

Establishing an Evaluation System

In establishing an evaluation system, the first step is to define the jobs and determine the qualities needed to fill them. It is impossible to measure something which is at best half-understood. Tri-party cooperation is needed between the programming staff, the supervisor, and top management. The programmers must feel that the evaluation system to be set up will be to their advantage, and management must give whatever support is needed to see that that system works smoothly. The supervisor, of course, must cooperate with both sides.

It must be recognized that standards for different programming jobs will have different measures. Some of the things a programmer does can be measured in terms of time to complete a job, others in terms of flow charts produced, while still others may involve the creative thought that went into the development of a program. Creativeness is perhaps the most important and at the same time the most difficult element to measure.

Another aspect to be considered in establishing an evaluation program is a "built-in" means of regulating itself. There should be some check within the system to keep it up-to-date and this check, if possible, should work more or less automatically, so it isn't forgotten over a long period of time. An evaluation revision schedule may be based on time (say every six months or so) or on a change in working conditions (new equipment or an improved language), but there must be some way of keeping the evaluation system in line with the realities of changing situations, especially

when changes are taking place as fast as they are in computer operations.

Supervisory Role

The programmers' supervisor plays a key role in the evaluation system. It is his duty to evaluate not only the amount of work produced, but also the quality. He must have at his disposal methods of keeping day-to-day or week-to-week charts and records for reference at the time of formal evaluation. The rapidly changing industry and the myriad details involved in any programming staff make regular notations a must for the supervisor who does not want to find himself evaluating his programmers in "broad terms" or on the most recent performance. For this reason, some consideration must be given to the number of programmers who can be supervised effectively by a single supervisor, as well as to the amount of time the supervisor can devote to a formalized evaluation system.

It is desirable—perhaps a must—that personal contact be maintained between the supervisor and the programmer as a means of augmenting his knowledge of the programmer as an individual. When the group becomes too large, either in numbers or in the complexity and scope of its operations, it becomes too much for one supervisor to handle effectively. Furthermore, the supervisor must look beyond his own staff. His responsibilities include constant comparison between the performance of his programmers and the programmers of other installations. This comparison may show deficiencies on either the part of the programmers or perhaps the part of the supervisor. A good supervisor, who knows his staff and the work that is being done, will make an average group of programmers work well and a better than average group work miracles.

Evaluation Form

The importance of providing the supervisor with the necessary tools for performing an evaluation has been recognized and an organization of computer users known as GUIDE (abbreviated from, Guidance for Users of Integrated Data Equipment) has developed an effective evaluation form through its Committee

on Education and Training. The form evolved by this committee is designed for use in maintaining a historical record of the programmer's abilities and progress. This Programmer's Development Form is illustrated on page 47.

It is interesting to note that the word "development" has been used on the form in lieu of the word "evaluation" because of a feeling that people, although they have a natural objection to being evaluated, do not object as strenuously when the evaluation is for the purpose of further development. This is not to say there will be no reaction against the procedure, no matter what it might be called, as there is a normal objection to anything that tends to move a person off "dead center."

The form is broken down into nine items or elements that provide for rating the programmer's abilities in four categories: Very good or Excellent; Good; Satisfactory; and Unsatisfactory. It also includes provision, immediately below the nine elements, for a description of the programmer's outstanding abilities, the areas that need improvement, and specific suggestions for improvement.

The real danger in using an evaluation form is the tendency to upgrade a programmer from one evaluation to the next with the result, after a period of time, all the programmers advance to the "Very Good" or "Excellent" category and the evaluation system reaches "the end of the line." It is just as important that a programmer's needs for development be shown as his improvements.

There may also be a tendency to fill out the evaluation form without the supporting notes or details required to complete the form accurately. Too much often is left to the vagaries of mental recall. It is important that day-by-day or week-by-week notes be made on programmer performance and that these notes and the supervisor's general knowledge of the programmer be used in filling out the development form.

When filling out the development form, the supervisor should evaluate the programmer on the basis of his job assignment and not necessarily in relation to other programmers. If this is done, a true picture is developed of individual progress and training can be given when the evaluation points up this need. It also is recommended that the form be held as a management document and

PROGRAMMER'S DEVELOPMENT FORM

(Name) Last First Initial

ition Name Time in Position Date Employed Education

scribe programmer's duties _____

_____

Organization Orientation	Very Good	Good	Satisfactory	Unsatisfactory
Technical Knowledge of Computer	Very Good	Good	Satisfactory	Unsatisfactory
Technical Skills in Programming	Very Good	Good	Satisfactory	Unsatisfactory
Completes Assignment	Quick and Accurate	Above average	Satisfactory	Unsatisfactory
Adapts to Situation	Readily	Good	Satisfactory	Unsatisfactory
Shows Initiative and Imagination	Excellent	Good	Satisfactory	Unsatisfactory
Understands Overall Assignment	Excellent	Good	Satisfactory	Unsatisfactory
Desires to Succeed	Excellent	Good	Satisfactory	Unsatisfactory
Cooperates with Others	Excellent	Good	Satisfactory	Unsatisfactory

Programmer's outstanding abilities _____

_____

_____

Where does programmer require improvement? _____

_____

_____

Type of suggestions for improving programmer? _____

_____

_____

Date _____ Interviewed by _____

not used as a communication device between the supervisor and the programmer. While the programmer should be informed of his weaknesses, this can be better accomplished through conversation.

Rating Elements

The nine rating elements on the form were developed to highlight those attributes generally conceded to be important to successful programming. Together they provide for a rather comprehensive review of the programmer as an individual and of his performance as a member of a program team. Assistance in rating these elements has been made available by the GUIDE Committee on Education and Training in the form of a series of pertinent questions, which may be used in channelling the supervisor's thoughts as he makes his evaluation. These questions will be listed for each rating element, followed by comment as appropriate:

1. *Organization Orientation*

   Does he understand his department organization?
   Does he know his responsibility to his department?
   Has he been informed?
   Does he understand the objective of his department and its relation to the company?

This element and its related questions are directed towards a determination of whether the programmer has acquired adequate information about the functions of his department in order to perform effectively as a member of the department. A rating of "Unsatisfactory" on this element might indicate supervisory deficiencies in explaining to the programmer his responsibilities.

2. *Technical Knowledge of Computer*

   Does he understand the capabilities of the computer system?
   Does he contribute technical advice?

This element is probably the easiest to rate since it relates to the programmer's grasp of the technical characteristics of the computer system with which he works.

3. *Technical Skills in Programming*

   Is he able to analyze a job in its entirety?

Is he proficient in developing logical flow charts and program statements?
Does he keep abreast of and use the latest techniques in programming?
Does he take advantage of the computer's capabilities?

These questions relate to the specific technical skills required in programming and the programmer's proficiency in applying the skills to best advantage.

4. *Completes Assignment*

Does he complete a job accurately?
Are all details considered?
Does he follow through until his program is running smoothly?
Does he conform to the programming and documentation standards established by your organization?

The importance of completing an assignment as promptly as practicable is obvious. Carelessness in handling detail, incomplete documentation, or failure to stay with the assignment until the program is operating routinely, can delay appreciably release of the program for production.

5. *Adapts to Situation*

Is he able to shift readily from one assignment to another?
Is he able to handle unusual or emergency situations?
Does he accept all assignments willingly?

The emphasis here is on the programmer's effectiveness as a member of a team. Is he sufficiently flexible to be moved from one programming application to another? Often a programmer will do a good job on a problem in which he is interested but falls short when assigned a task he considers less interesting.

6. *Shows Initiative and Imagination*

Is he creative?
Does he conceive and develop new approaches or solutions to problems?
Is he a self-starter?
Does he make prompt and logical decisions?
Does he require a minimum of supervision?

This element is one of the more difficult to rate. Creativeness is not easy to measure but there are certain indicators which generally mark a programmer as being creative, such as his record of coming up with new solutions to problems. Another consideration here is the degree of supervision required. The programmer who requires a minimum of supervision is indeed an asset, especially when supervision is a sizeable job.

7. *Understands Overall Assignment*

   Does he see how the various operations fit together to perform the overall function?
   Does he view each problem realistically and develop the most simple solution?

A programmer's ability to see problems in their entirety and develop simple solutions is particularly important. Too often programmers become involved in details and tend to lose sight of the overall objective.

8. *Desires to Succeed*

   Is he ambitious?
   Does he have a definite plan for his own advancement?
   Does he try to correct his own weaknesses?
   Is he continually seeking more responsibility?
   Does he have a strong desire for commendation?

Everybody presumably has a desire to succeed but the concern here is focused on whether this general desire is supported by a reasonable effort to correct any weaknesses and a willingness to take on additional responsibility.

9. *Cooperates with Others*

   Does he work well with others on programming assignments?
   Is he willing to assist others?
   Does he have the confidence and respect of his associates?
   Does he notify others of changes?
   Does he accept responsibility for making changes when notified by others.

Cooperation with others is probably the most important element in the whole evaluation system. What the supervisor should

be considering here is, in essence, whether the programmer is helping with the solution or is part of the problem.

General Summary

In implementing an evaluation system, the following points are of major importance:

- Management Participation, which means that the system must be sold to management and their direct active participation obtained, thereby providing the necessary follow-through to see that the procedure is carried out.
- Day-by-day or week-by-week documentation of facts about a programmer as they develop.
- Assemblage of these facts prior to interview time, so that they can be used in the interview with the programmer.
- Prompt recording of the results of the evaluation or interview, on the development form, to provide a progressive summary of the programmer's status and needs.
- Periodic assessment and revision of the system, to keep in phase with changes in the organization.

Management monitoring is probably most important in seeing that the system is not soon by-passed. If proper monitoring is provided, there is a good chance the procedure not only will be installed but will be continued in operation.

QUESTION AND ANSWER SESSION

During the question and answer session which followed Mr. Bizzell's address at the Symposium, he discussed numerous phases of computer operations. Among the topics covered were the following which have been summarized from the transcript of Symposium Proceedings. The questions appear in italics and Mr. Bizzell's replies follow in roman type.

Quantitative Evaluation

Our agency has a comprehensive program for measuring clerical productivity quantitatively, with standards specifying the number of documents by type which should be processed per man. Do you foresee any such approach in programmer evaluation, whereby output in terms of program steps might be predetermined for each programmer?

This approach was tried in the early days when an attempt was made to define the number of programming steps a programmer should complete each day. With modern programming, it's possible for a programmer to write one sentence and produce pages of instruction. The fact that a programmer writes fifty instructions doesn't mean he couldn't have done the same thing with four. Some may not agree with me, but in my opinion number of program steps is not a good measure of productivity.

Scope of Evaluation System

When you speak of programmers do you have in mind only those who supply the machine instructions or do you include systems analysts as well?

The system is designed primarily to evaluate technical programmers—those who take a problem and convert it to machine instructions. However, many of the rating elements on the development form relate to qualities one would seek in any employee. There are only about two elements, Technical Knowledge of Computer and Technical Skills in Programming, which would not apply to systems analysts. At Southern Railway our programmers do a considerable amount of systems work. I would estimate that approximately ninety per cent of their time could be placed in the systems category, with only about ten per cent of their time devoted to converting the problem to computer instructions.

How would you apply these evaluation procedures to a programmer who must research the problem in addition to doing the technical programming?

Combining these two functions gives your people a real challenge. I think programming can become very monotonous unless some other challenge is provided, but how one measures performance of systems analysts is a good question. I'm still looking for the answer myself.

You mentioned that consideration should be given to the number of programmers under an individual supervisor. Where do you draw the line between how many are too many and how few are too few?

In my opinion supervision of more than fifteen or twenty programmers gets somewhat out of bounds. I think you will find in most organizations having only one formal supervisor, that the supervisor passes along part of his responsibility to one of the programmers and that programmer in turn acts in a supervisory role. Whenever there are too many programmers under one supervisor, the supervisor begins to lose supervisory control. This may be an area of disagreement, however, as I know of much larger programming staffs under one supervisor.

Wouldn't you consider the type of work being supervised a material factor? I have in mind here the difference between supervising machine instructions and supervising the entire job, which would include analysis plus machine instructions.

The type of work being supervised is definitely a material factor. In fact most systems men are inherently supervisors themselves, but a programmer can also be regarded as a systems man. Although he does not define the problem to be placed on the computer, he must define the method the computer will use in handling the problem once it takes over. It's difficult actually to separate the two kinds of effort. I have talked to numerous officials in different installations who have set up separate systems and programming staffs and later found that these staffs were becoming so intermeshed that they no longer operated as separate staffs. Whenever separated, the staffs have a tendency to work back together. In any event I agree that the type of supervision required differs with the type of work being supervised.

Modular Programming

Wouldn't you consider a separation of systems and programming inefficient? When one man handles an entire area

from inception through programming, he knows every phase of the area. During his researching of the problem there are probably many different techniques floating through his mind which lead him eventually along specific paths toward specific types of equipment. I would think the separation of systems from programming is inefficient, because the responsibility is transferred amid stream from one person to another and inevitably is transferred without the communication of ideas in all of the necessary detail.

The crux of the problem lies not in which is the more efficient but in protecting your organization from the loss which would occur if this one man were to leave and nobody else were familiar with the area. We used the individual approach when we first started our programming group at Southern Railway but we're now following an approach described as modular programming, under which we divide an assignment among many programmers. One good feature of this approach is that there is more than one person in the organization with a working knowledge of each problem area.

With modular programming don't you have to impose added documentation requirements on a programmer in order to get the program completed?

Admittedly documentation requirements are more rigorous under modular programming, but this approach avoids the pitfalls of letting each programmer create his own little kingdom. You must recognize that as soon as he gets a better offer he will abdicate this kingdom.

But aren't there major advantages in the integrated approach? If additions are made to the routines by the person who devised them, it's still one program.

It is if there is some systematic method of programming, but often so much individuality is built into a program, particularly if the programmer happens to be one of the tricky types, that any change in his requirements blows the program sky high. If you don't establish some systematic method of programming, you not only have to know the computer but the programmer as well. One of the virtues of modular programming is the assurance it gives of program compatibility.

Won't programming be considerably simplified if COBOL proves successful?

I think a common computer language is the answer, not necessarily to programmer difficulty, but to machine compatibility. Without a common language a change in equipment may involve many man-years of reprogramming. A common business language is a device to combat the reprogramming problem, but no matter how many languages are developed, the languages don't work by themselves and programmers are needed to straighten them out. In other words, language itself is a program.

Programming Progress

How can the programming supervisor depict rate of progress in explaining his operations to his supervisors?

Fortunately in our organization management is computer conscious and is well versed in computer problems. Thus when I'm asked how long would it take to complete a project, I can give a brief explanation of the computer complexities involved. To answer the question specifically, I have enough knowledge of my own operations to be able to estimate fairly well when data can be provided. Then if the requirement is more urgent, I'm able with modular programming to reassign as many programmers as may be needed to meet critical deadlines.

But how do you keep yourself abreast of the status of a particular project? Is it by checking on the program each few days or each week to find out how much has been accomplished?

Yes, this is really the only method that I know of to use. At first we tried using a chart with the problems listed vertically and time horizontally. We had markers to indicate the time for completing the flow charts, the time

for coding the program, and so forth. When we found our programmers were beating the schedule we got rid of the chart.

Note: At this point the Chairman of the Conference commented to the effect that part of the answer might lie in the PERT system described in Mr. Fazar's article on page 123. PERT was designed to program research and development effort in the Navy but presumably could be applied to any such situation as this if the project were large enough to warrant the effort.

AN AMERICAN CREED

I do not choose to be a common man. It is my right to be uncommon—if I can.

I seek opportunity—not security. I do not wish to be a kept citizen, humbled and dulled by having the state look after me. I want to take the calculated risk; to dream and to build, to fail and to succeed.

I refuse to barter incentive for a dole. I prefer the challenges of life to the guaranteed existence; the thrill of fulfillment to the stale calm of Utopia. I will not trade freedom for beneficence nor my dignity for a handout.

I will never cower before any master nor bend to any threat. It is my heritage to stand erect, proud and unafraid; to think and act for myself, enjoy the benefit of my creations and to face the world boldly and say: This I have done.

All this is what it means to be an American.

. . . from The New Guide for Toastmasters and Speakers by Herbert V. Pronchnow, a volume published by Prentice-Hall, Inc.

A Treasury Panel

Converting a Large Computer Operation to a More Powerful Computer

The large volume of checks issued in carrying out the functions of the Federal Government has always posed a procedural problem for the Department of the Treasury. First mechanized in 1956, Treasury check payment and reconciliation processing operations rapidly outgrew the original electronic procedures and recently were transferred to more powerful equipment. This account by three Treasury officials who supervised the successful transfer of a mass volume operation from one computer to another ranks as a significant milestone in data processing achievement. Mr. Conner in the first article describes the basic reconciliation procedures and summarizes the background considerations which led to the decision to transfer processing operations to more powerful equipment. Mssrs. Endres and Beck then cover the systems and programming factors involved in making the conversion.

Reconciling Checks Electronically

By Roy O. Conner

Each year there are more than 400 million checks written on behalf of the Federal Government. These checks are issued by some 2,400 different disbursing officers, under 2,400 separate accounts all carried in the name of the Treasurer of the United States. The Federal Reserve Banking System, through its 36 units that act as fiscal agents for the Treasurer of the United States, clears these checks when presented by member banks and for-

wards them to the Office of the Treasurer for final payment. Sooner or later checks clear through the banking system and must be reconciled in the Office of the Treasurer of the United States for much the same reason any prudent individual or business firm reconciles checking transactions.

The Electronic Data Processing Division of the Office of the Treasurer of the United States services the Treasurer's checking accounts against which these checks are drawn. Servicing encompasses the function of reporting on the status of individual checks concerning which claims or inquiries have been received and reconciling reports of checks issued by the 2,400 disbursing officers with reports of checks cleared by the Federal Reserve Banks.

Before 1956, checks were sorted physically in the same manner an individual sorts his personal checks upon their return from the bank. This procedure was cumbersome and the problems of handling this staggering volume of paper were rapidly becoming overwhelming. In 1956, an IBM-705 computer was installed to record all checks without sort, in the sequence in which they came from the banks. Once this data was transferred to magnetic tape, the checks themselves were stored and the data from the checks was sorted by computer processing.

Computer Reconciliation

Each check received by the Electronic Data Processing Division is assigned a file locator number which is imprinted on the

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MR. CONNER

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check at the time the data from the check is transcribed to magnetic tape. This file locator number—something new and unique—is a 10-digit number printed on the face of each check as it goes through the tape converter. It is recorded on the tape along with the account number, serial number and amount of the check. In processing the checks, batch totals are obtained and printed out to facilitate balancing to the charges by the bank. The checks are then replaced in the file boxes in which they were delivered, in the order of the new locator numbers, and are transferred to a warehouse where they are held for eight years. If during this period any individual check is required, for examination of an endorsement or any other purpose, it is readily located by reference to its locator number.

After the data on the checks have been converted to magnetic tape, the tapes become the medium for subsequent data processing operations. The reels containing the converted check data for the day's business are first balanced and then sorted by disbursing officer account and check serial number. The sorted checks are next processed against a summary master control file, which contains for each disbursing officer records specifying the range of acceptable check numbers, whether specific checks should be intercepted or not, and issue and payment data at both disbursing officer level and sub-blocks within a disbursing office. During the course of this programmed run, the summary records are tested as to status regarding age, activity count and paid-amount versus issued-amount, and appropriate control records are generated. An edit tape is prepared during this run for later use in producing various accounting reports to reflect the scope of the day's business in terms of total activity for each disbursing officer, checks that have been intercepted and items in error.

Checks found to be "acceptable"—those against which no stop-payment notices have been issued and which are within the range of numbers assigned to the disbursing officer—update the master files and are written out on an output transaction file. This output file, which represents the total accepted business for the day, is divided into five segments, each comprising the output for a group of disbursing officers whose combined check volume accounts for approximately one-fifth of the entire disbursement

activity. Corresponding segments from each of the five preceding working days are merged into a single sequence, by disbursing officer and check serial number, and are then ready for the first file maintenance run.

The first file maintenance run is made against the corresponding segment of a large matrix-type master file, which is used to accumulate individual check data, in condensed form, during the six to eight week period of high activity which follows the date of issuance of any given block of checks. The purpose of the run is to update the storage or matrix file, which thus is serviced every five days. This updated matrix file then contains, in condensed form, all the data pertaining to a block of checks: their location, amounts and similar significant data.

Since about 98 per cent of the checks issued in any given block are received and paid within six to eight weeks after issuance, the block is then removed from magnetic tape for purpose of economy and is printed out on form paper which is serialized and retained for subsequent reference. A tape record is maintained of these items in order to facilitate the task of answering inquiries concerning the detail which has been printed. At the same time any outstanding items are transferred to an outstanding tape file for further servicing. The file of outstanding items also carries summaries of checks issued and paid, up to the date of the transfer to paper. It is through these procedures that the size of the matrix file is kept down to the significant check data for from 60 to 80 million active items at any one time.

The next computer operation involves servicing the file of outstanding items which, as has been explained, are the checks found to be still outstanding at the time the matrix block is reduced to printed form. This file contains summary information for all blocks which have been removed from the matrix file but which have not as yet been completely paid up. Checks that are returned subsequent to the removal of the applicable block from the matrix file are entered in this file and stragglers often necessitate maintenance of the file over a long period of time.

An average of 1,600 inquiries regarding the status of checks are received daily in the Electronic Data Processing Division. These inquiries come from other branches and divisions of the

Treasury Department. The replies made in response to these inquiries either inform the inquirer that the check is outstanding or, if paid, provide him with its locator number so that the check can be pulled from the files for examination.

Through improvements in systems design, involving predeterminations of outstanding amounts, it has now become possible to reconcile each block of work in the system automatically and report out for manual investigation only those blocks found to be out of balance. Generally less than one per cent of the blocks require manual investigation. In addition, provision has been made to immediately detect overpayment conditions as they arise, in order that they may be promptly investigated.

Changeover Considerations

The original machine procedures for reconciling checks were designed around the IBM-705 computer and did not differ much from those in use today. However, the demands on the equipment in time outgrew its capacity and recently processing was transferred to two newly-installed IBM-7070 computers. The two major considerations which led to this changeover to more powerful equipment were: the lack of computer reserve capacity and the increasing difficulties being encountered in servicing check inquiries. Three months of the year, March through May, the IBM-705 computer was in operation three shifts a day, seven days a week, and the annual increase in check volume runs about four per cent. In fiscal 1961 the volume of checks processed was 440 million; in 1962 it will run approximately 458 million. With the IBM-705, the master files had to be split into halves because their volume exceeded machine capacity. Each half was serviced on alternate weekends and thus two weeks might elapse before a report could be furnished on the status of a particular check.

A third consideration was the possibility of savings since the estimates for the new equipment indicated that rental costs would be somewhat less, despite improvements in the quality of service rendered. Even if additional costs had been involved, however, the first two considerations would probably have led to a decision to make the change to more powerful equipment, provided of course the increased costs were reasonable in relation to the improvements in prospect.

In planning for the installation of new computers there was one requirement that was paramount: there could be no cessation of operations during the period required for the changeover. Absolute continuity was mandatory. It was obvious, therefore, that a different physical location would have to be found for the new computer system and with the full cooperation of the General Services Administration this was arranged.

Past experience in programming for the check payment operation prompted a fairly conservative approach with respect to the amount of time that should be provided for testing and debugging programs for the new equipment. Since final testing would involve dealing with large quantities of data, and with large master files which would have to be converted, it was felt that not less than three weeks of parallel operation should be scheduled for the period immediately preceding the contemplated changeover. In view of these considerations, sufficient funds were budgeted to provide for simultaneous usage of both computer systems for a period of several months. It is fortunate that this approach was taken, since it is now clear that a less conservative one would have led to rather serious difficulties.

Systems Analysis and Programming

By Joseph E. Endres and Edward R. Beck

At the time the decision was reached to make a changeover to more powerful equipment, the computer system in operation included several thousand reels of magnetic tape, a battery of specialized peripheral equipment and huge master files containing live data. It was most important, therefore, that the new computer system be compatible with the old one, particularly in regard to input and output tape requirements. Initially it was decided to update the system with an IBM-705, Model 3, which would provide urgently needed reserve capacity and at the same time afford an opportunity for improved check-claims servicing. Four months later, after about 40 per cent of the programming

for the IBM-705, Model 3, had been completed, the new IBM-7070 was announced.

Approximately as powerful as the IBM-705, Model 3, the IBM-7070 is a fixed-word-length computer in contrast to the variable-word IBM-705 series computers. To switch to the IBM-7070 would require some re-education of the programming staff, systems analysts and a number of the operating personnel. A study indicated that these costs and the programming efforts already made in anticipation of acquiring the IBM-705, Model 3, could be absorbed. Furthermore, by ordering two of the IBM-7070 computers, not only could sizable savings be effected but it would be possible to keep workload current by doubling the workload on one computer if the other were down for extensive repair.

Accordingly, with management's approval, two IBM-7070s were ordered, personnel were schooled in the new computer language, and programming for this computer was commenced. At about this time another new computer, the IBM-1401, was announced. The IBM-1401 is a small computer equipped with a high-speed printer, a card reader, a card punch and tape drives. Because of the great desirability of these features, an IBM-1401

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was ordered in lieu of comparable accessories for the two IBM-7070s already on order.

Conversion of Programming

The check payment and reconciliation operations in the Office of the Treasurer require six major programs for the IBM-7070s—none of less than one hour duration on the computer—and six major programs for the IBM-1401. Initially programming responsibilities were divided between two lead analysts. One assumed control over the three programs involving Federal Reserve Bank balances, the clearance of checks against the ledger and the stop-payment file, while the other supervised the file maintenance operation—the merging and updating of the main check file and the updating of the outstanding file. The programming effort for the IBM-1401 was also equally divided. Due to the fact that system analysts and programmers were faced with not one but two new computer systems, these responsibilities were realigned as soon as the testing stage was reached, to give supervision of the 7070 programs to one and supervision of the 1401 programs to the other.

Program aids provided by the manufacturer proved very helpful in the conversion of the previous IBM-705 programming. One outstanding example is the standard Input-Output-Control-System package program, called IOCS. This standard program contains all of the instructions needed to read and write tape records, including: routines for handling errors; end-of-file and end-of-job routines; tape-labeling routines; and check-point and restart routines. These thoroughly-tested instructions comprise about 40 per cent of those required in most large programs and may represent as much as 60 to 80 per cent of some. Their use not only enabled the programming staff to devote more time to the other areas but provided a standard input and output routine for all programming. Standard routines also simplified the console operations.

In computer operations there are three time factors: time to read the tape into the computer; time to process the computer; and time to write the output tape. The newer computers are equipped to handle these three operations simultaneously, per-

forming in one period of time what formerly required three, but the computer programs must be written to take advantage of this feature. One of the most valuable benefits of the IOCS package is the fact that it provides procedures that have been tested and found through experience to be efficient in handling data. Knowing that the *handling* of data is taken care of permits the programmer to concentrate on the instructions for *processing* the data while it is in the computer, so that process time as nearly as possible will equal tape time.

In the IBM-7070 system, there are 154 instructions compared with only 40 in the IBM-705 computer previously used. Programming for the IBM-7070 is more complex than for the IBM-705, but gives the programmer a wider latitude for displaying his talents for writing an efficient program. For example, there may be two or three methods for performing arithmetic operations, for making decisions or for moving records internally within the computer. When there are several hundred different programs to be written for an IBM-7070 computer and all are short jobs—requiring perhaps ten minutes a day, half an hour a week, or a few minutes once a month, with some to be run only once—effort is necessarily directed towards getting the programs written, tested and operating, not towards saving a few microseconds through shortening instructions.

Selecting instructions or formats does not always mean choosing the one shown in the manual that requires only 40 microseconds as against one that requires 60 micro-seconds, because the savings realized at one point may be more than offset by the use of instructions that are time-consuming elsewhere in the program or in another program to follow.

In the programming conversion, the search for the most efficient programs was extremely thorough. When two million checks are processed daily, and this is a normal volume during the income-tax refund period, there is a daily total of 58 million operations. The records are read from tape into the computer ten times, processed ten times, and written from the computer onto output tape nine times—a total of 58 million operations. If only 144 micro-seconds per operation are saved in each program, about $4,800 is saved yearly. Since each of the six major pro-

grams has from 4,000 to 8,400 instructions, the potential for savings is quite substantial.

Conversion of Master Files

Inasmuch as the master files used in the IBM-705 system were not suitable for use in the IBM-7070 system, programs had to be written to convert the master files. The changeover was considered an opportune time for streamlining and generally revising them with a view to creating files that would contain all necessary information on a minimum of magnetic tape. Attention was also given to developing a type of record that could be processed at maximum speed on the IBM-7070 computer.

Conversion programs were developed for use on the IBM-705 to allow complete testing and debugging of the programs long before the new computers were delivered. It was recognized that while this procedure would considerably relieve the testing burden on the IBM-7070 system, it would place a heavy workload on the IBM-705 at the time of conversion. To relieve this situation the conversion of the largest and most time-consuming master file was also programmed for the IBM-7070 computers. This dual programming provided the option of using either system in converting this master file and simplified the problem of testing the two programs for the IBM-705 and IBM-7070 respectively. Since both programs converted the same master file, a simple tape comparison of their outputs could aid in locating any programming discrepancies. As it worked out, the IBM-7070 system was used in converting the largest master file and the IBM-705 was used for all other files.

Other Conversion Considerations

Controls and protective measures are necessary for any new system. During parallel testing, temporary controls were maintained for verification purposes but permanent controls also had to be established. Experience indicated that the new system with IBM-7070s and an IBM-1401 could be controlled more efficiently by internal controls that could be programmed than it could by external controls and report forms. The new system featured

many such program controls and the testing and parallel runs confirmed the soundness of this approach.

Another consideration involved in the introduction of a new system is the education of personnel. Not only was it necessary to train programming and operational personnel in the new computers, but other personnel as well. One of the objectives in changing to the new system was the refinement and improvement of the check-payment and reconciliation operation. Some of the many major changes made resulted in clerical procedural changes in other offices in the Treasury.

The methods for making adjustments to the electronic system were revised. Those previously used were discontinued and new ones were introduced. The new methods reduced the number of manual adjustments needed and produced more efficient adjustment systems. A method for making automatic adjustments under certain conditions was programmed into the electronic system.

Utilization of the new equipment for production purposes before the cutover involved consideration of rental costs, available machine time, backlogs of work in the old system, programming time available and adaptability of the new equipment to perform the operations of the other systems with a minimum of effort. When no testing or parallel running was being performed, the new IBM-1401 was used for production. This aided in reducing the backlog of work and permitted the discontinuance of the contract for the rental of the old equipment on schedule.

Conversion Lessons

On the whole the conversion undertaken in the Office of the Treasurer of the United States to change electronic processing from IBM-705s to IBM-7070s and an IBM-1401 was extremely interesting and highly satisfying. From the experience gained in this undertaking it can be said that anyone concerned with the conversion of a computer system would do well to consider:

- Teaming an inexperienced or newly-trained programmer with an experienced programmer.
- Giving careful consideration to master-file conversion programs.

- Using good personnel on all assignments.
- Guarding against overeagerness to test the new computer.
- Allowing the engineers ample time to check the equipment thoroughly before taking over.
- Spending as much time as possible in checking programs before actual machine testing is begun.
- Planning parallel test runs to include as much volume as possible.
- Providing generous allotments of time in planning conversion schedules—unforseen problems do arise and machine failures on new equipment must be expected.
- Using packaged programs furnished by the computer manufacturer and assigning a programmer to familiarize himself with each—they should become experts in order to see that the systems function properly and are currently maintained.
- Avoiding undue overtime for any individual programmer—a tired programmer can cause much damage.
- Having the machine testing controlled by one person who is made responsible for scheduling on a priority basis and for coordinating all operations.
- Verifying the results of the parallel operation in minute detail—overlooking a seemingly minor detail may be costly.

John R. Provan

Service Center Processing

Of all the decisions an agency must make with respect to data processing, none is more important than its evaluation of the relative advantages of service center versus in-house processing. Some of the more important factors to be considered in resolving this question are explored from an agency point of view.

There are no laws that decree where or how data processing functions must be performed in the Federal Government. Nor are there any Executive Orders or other government-wide directives that predetermine these matters for an individual agency. Each agency is therefore free to make its own determinations on the basis of the merits as it may evaluate them. An agency may perform for itself whatever data processing it deems necessary, or desirable, or it may look elsewhere for this service. Within its own organization an agency may prescribe centralized processing or it may permit decentralized processing in the various agency subdivisions.

Data processing by its nature is a function which can be performed most economically as a volume operation. The arguments favoring centralization of data processing functions are many and impressive if special purpose computers are excepted. The incontestable case for a small computer tied to a reactor, for instantaneous analysis of reactor data, must be conceded. There are other exceptions of a similar nature which also must be conceded, but all of these specialized computer installations preferably should be subsidiary to and function as an adjunct to some centralized processing organization.

Advantages of Centralization

The advantages of centralizing data processing functions, in order to achieve optimum processing volume, are too well known

to require extensive discussion. The more important advantages relate to optimum use of equipment and optimum use of personnel.

Centralized processing permits the acquisition and use of a much more powerful and flexible combination of equipment than would be possible in scattered agency installations. Any individual job can be accomplished more effectively with this complex of equipment and a much greater variety of applications can be accommodated. Better utilization of equipment is possible. Shifts can be used to extend the operating hours and fuller utilization of the potential running time can be achieved. The inevitable lost motion that occurs when each subdivision of an agency goes through the process of visiting plants, listening to sales talks and evaluating equipment features is eliminated. In a centralized operation this process takes place once and there is no need for a constant repetition of the effort throughout the agency. Installation costs are minimized. Even with transistorized equipment, computer installation costs are expensive. The equipment cannot just be moved into a room and plugged in. Temperature control, high intensity lighting, special foundations and elaborate wiring are necessary and can be obtained at lower cost for one large installation than for a number of smaller installations.

The personnel advantages are equally impressive. Better grade levels can be justified in a centralized operation than are possible in scattered specialized installations. The higher grades attract the best trained and most competent personnel. Although jour-

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neyman programmers and procedures analysts are plentiful, qualified supervisory personnel are scarce. Relatively few are capable of visualizing the broader aspects of systems design and integration. The few who do grasp more than coding and detailed programming, and who can do a masterful job of programming an application for a complex of equipment, are able to employ these scarce talents to greatest advantage in a centralized operation. Moreover a centralized installation provides greater opportunities for data processing leaders to emerge. There is a transferrability of experience which takes place when men of varied backgrounds are brought together in data processing in its broadest application or concept.

There are other significant advantages as well. A centralized operation provides the opportunity, and this is of the utmost importance, for greater recognition of and attention to the potential integration of the various applications within an agency. Fiscal data handling is very closely related to the general information requirements of an agency and can readily be integrated with these other data requirements into one agency-wide information system. Not to be overlooked either is the opportunity for experimentation in advanced application that is made possible by the concentration of skill and equipment in a large centralized operation. Centralized processing also can further cost consciousness in the agency, if operated on a cost-reimbursable basis and the charges to its customers are clearly set forth.

Where to Centralize

Although at least some centralization of functions to permit volume processing is generally recognized to be desirable, the degree of centralization that is most effective and the organizational location that is best for the centralized operation are less clearly established. Three different levels may be distinguished: the intra-agency service center, the interagency service center and the commercially-operated service center. All three arrangements exist today and each has its advantages and its proponents.

Intra-agency service centers undoubtedly represent the most common form of data processing centralization in government. However, a study completed by the Bureau of the Budget last

December identifies 47 government agencies which are obtaining data processing assistance from two other agencies on 78 different projects. Reimbursements for these projects are running in excess of $2.5 million a year. Additional outlays are being made for the use of commercially-operated service centers, of which there are many throughout the United States and abroad.

The Case for Intra-Agency Service Centers

The most compelling argument for the intra-agency service center is, from the standpoint of an agency, retention of control within the agency. The agency itself has full control over personnel, procedures and priorities. Control over priorities is sacrificed whenever an agency becomes a customer of an outside service center, whether within government or outside of government, and the agency then must take its turn along with the varying priorities and demands of others. Most agency needs, for example, would rank well below an emergency requirement for a distribution analysis of the nation's bomber force. Thus an agency must operate its own service center if it is to be absolutely certain of always having at its disposal the data it feels it should have in order best to carry out the programs for which it is responsible.

Other major advantages stem from the close association that naturally exists between the intra-agency service center and agency programs. The personnel staffing the intra-agency service center are more familiar with the requirements of the different agency programs and with their peculiarities. They are also more likely to have a basic interest in the success of these programs. This greater interest in programs often is a vital factor in data processing effectivity. An outside service center is much too prone to overrate the importance of technical application of equipment to the particular job at hand and in so doing often fails to contribute effectively to the total system approach necessary for the best systems engineering.

The intra-agency service center develops in-house experience and skill which are invaluable to the agency in managing its programs. What the agency learns, it retains; it avoids having to pay others to learn agency operations in order to make only a relatively

limited contribution to agency objectives. Some also consider an advantage the avoidance of perplexing problems of funding, costing and selection itself. The process of selecting an outside service center can be very troublesome, particularly when the application desired hasn't been adequately designed, which often is the case in advanced systems.

No mention has yet been made of relative costs. These of course are difficult to measure definitively but the other advantages are so substantial that the intra-agency service center can be and should be less expensive than alternative arrangements. Perhaps an exception should be made for the smaller agencies, but even in the case of the smallest agencies the very substantial intangible benefits that result from in-house processing should not be too readily discounted.

Outside Service Centers

Despite the many advantages that accrue to an agency which operates its own service center, many agencies find it advantageous to use government or commercially-operated outside service centers, on occasion to supplement their own facilities but in some instances in lieu of maintaining facilities of their own. Not every agency has the time, interest or resources to develop its own computer competence. Smaller agencies particularly are likely to look to others for computer service but even large agencies find outside service center facilities useful in handling special non-recurring projects and in providing backup capacity to meet peak demands.

Large service centers permit the pooling of resources at a high level and foster more effective utilization of whatever limited resources may be available. Resources of course include not only the computer hardware but the entire complex of services which have to surround the hardware in order for a computer installation to be reasonably productive. Programmers, systems analysts, design experts and mathematicians, along with assemblers, compilers, program libraries and similar facilities which the industry refers to as "software," are most important elements of a computer installation. Small installations simply cannot afford a full com-

plement of these important resources and therefore are likely to be rather handicapped in terms of what they are able to do.

Probably the strongest argument for outside service centers is the scarcity of in-house competence. Knowledgeable computer specialists are at a premium in a field that is unfolding so rapidly it is extremely difficult to keep abreast of new developments. Very few if any actually understand the full potential of computers in handling management problems. While every agency should have some in-house competence, the question of how much in-house competence to develop is one which necessarily is best answered in the context of the size, missions and problems of each agency.

COMPARATIVE SALARIES IN INDUSTRY AND GOVERNMENT

Occupation	Industry National Average	Federal Classification Act Range		
		Grade	Minimum	Maximum
Accountants I	$ 5,736	GS- 5	$ 4,345	$ 5,335
Accountants II	6,324	GS- 7	5,355	6,345
Accountants III	7,200	GS- 9	6,435	7,425
Accountants IV	8,724	GS-11	7,560	8,860
Accountants V	10,548	GS-12	8,955	10,255
Auditors I	5,196	GS- 5	4,345	5,335
Auditors II	6,468	GS- 7	5,355	6,345
Auditors III	7,728	GS- 9	6,435	7,425
Auditors IV	9,480	GS-11	7,560	8,860
Chief accountants I	9,564	GS-11	7,560	8,860
Chief accountants II	11,484	GS-12	8,955	10,255
Chief accountants III	11,928	GS-13	10,635	11,935
Chief accountants IV	15,012	GS-14	12,210	13,510

. . . Bureau of Labor Statistics Survey released in November 1961

Eugene H. Mock

Paying Five Million Veterans

In a project widely acclaimed a model of interagency cooperation, the Veterans Administration, Treasury and Post Office Departments pooled resources to attack interrelated problems on an integrated basis. Interlinked electronic data processing systems proved to be the solution to multi-agency procedural problems involved in making five million veterans benefit payments monthly.

Paying five million veterans the varied amounts due them according to the diverse laws applicable, at the precise times due, is the rather formidable undertaking of the Veterans Administration under its disability and death benefit programs. Payments under these programs cost about $3.6 billions annually and represent the largest area of expenditure in the Veterans Administration. Involved are monthly payments to 3,200,000 veterans and to an additional 1,600,000 orphan and widow dependents, making in all 4,800,000 separate payments totalling $300,000,000 monthly.

Veteran and dependent beneficiaries covered by this program live in all of the United States and in many foreign countries. They form a highly mobile group, moving on the average once every five years. They receive benefits under many different legislative enactments. Widows and orphans still are receiving payments as beneficiaries from wars as far back as the Civil War. Every war produces new groups of beneficiaries, and veterans and dependents who are potential beneficiaries under existing legislation number well into the tens of millions.

Administration of the Program

Administration of this huge benefit program is decentralized to 67 regional offices, 65 located throughout the United States and one each in the Phillipines and Puerto Rico. Each regional office serves as the focal point of contact between the Veterans Administration and all veterans residing in the geographic area. A vet-

eran who considers himself entitled to benefits first presents his claim to one of these offices and the evidence suppporting the claim is evaluated there, in a process referred to as adjudication, to determine entitlement and if so how much. The adjudication process is rather complex, and often long, because service records, medical surveys, hospital reports and similar documents must be assembled from all parts of the country and thoroughly researched.

Many statistical requirements are superimposed upon the routine record-keeping associated with compensation and benefit payments. There are continual requests from Congress for data on how much is being paid, for what, for use in considering new legislation or in evaluating budgetary needs. Many other agencies have an interest in differing phases of the program and call for data on its various aspects. Veterans organizations in particular have a strong interest in the program, and all data concerning it, and the public generally seems to have much more than merely a passing interest in matters relating to veterans.

Until recently these 67 regional offices dealt with 21 Treasury disbursing offices. The required payment data would be forwarded to a Treasury disbursing office in punched card form and there used to establish or update a pay file. A check would then be prepared in the disbursing office for each beneficiary, usually on punched card equipment but at times by addressograph or some other process. The disbursing office would mail out the checks and forward a list of the checks to the Treasurer of the United States for use in reconciling these millions of checks upon return from the

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banking system. The post offices in these 21 cities in which disbursing offices were located also had problems each month with the deluge of payment checks that had to be manually sorted and delivered throughout the United States and abroad.

Even inquiry letters proved troublesome. Whenever a veteran failed to receive a check he was expecting, he naturally wrote to the address given on the envelope in which some previous check had come. This of course was the disbursing office and thus the disbursing offices had become very much involved in handling the many inquiries that came in, and had to spend considerable effort in contacting other agencies for information to answer these inquiries.

Objectives Sought

When consideration was first being given some years ago to ways of improving the administration of this program, the idea evolved of having a single set of records which could serve all purposes, not only those of the Veterans Administration itself but throughout Goverment. The various agencies participating in the benefit program in one capacity or another were viewed as carrying out a common mandate laid down by the Congress. They were jointly responsible for seeing that the veteran received the benefits to which he was entitled by law and each shared in a general desire to perform this assignment as efficiently as possible.

At the time there were at least three sets of overlapping records within the Veterans Administration alone, each stemming from its separate sources and each used to record information developed in the processing of a claim. Each carried the same claim number and the same address and each was prepared separately at different stages of the adjudication process. The same information was then passed along to a Treasury disbursing office and again was recorded in still another record. Some method of integrating these different records so that information would be recorded once only was thought to be possible, and if it could be found, should serve to reduce record costs while greatly increasing record accuracy. This then became the first objective delineated in the improvement effort.

Improved accuracy was the second objective. Despite a most

conscientious effort to maintain accurate records under existing procedures, the accumulative rate of error which had crept into the records was high. A veteran is compensated for specific disabilities. It obviously was desirable to record these disabilities so that the characteristics of the veteran population could be known, and the procedures in use had been designed to provide this kind of information. However, a large number of cases contained errors in some form, even though for any particular item of information the error rate was relatively low. None of these were major errors but even minor errors caused some distortion in the statistics on the veterans population needed in considering legislation affecting veterans.

A third objective was to eliminate the multiplicity of systems designed to cope with the uneven workload among the regional offices. One regional office had as few as 3,000 cases and another as many as 180,000 cases. Unless workload could be equalized or the processing centralized in some way, different systems would have to be used since a system designed to handle 180,000 monthly payments efficiently could not produce an efficient result on only 3,000 cases. Centralization of processing seemed the most likely solution but any decision would have to await the development of an appropriate plan.

The final objective was quite closely related to the third. In many of the regional offices there wasn't enough work of a particular type to warrant a staff capable of handling that type of work. The advantages of specialization were being lost and the resulting costs were higher than they should be. Reducing these high costs was an obvious objective of any new system because reducing cost is always a management goal in government operations.

Design Considerations

A total systems concept, with integrated data processing, seemed to hold greatest promise for an effective solution to this complex processing problem involved in making veterans payments.

An analysis of the data input into the system disclosed 25 different transaction types: original awards, amended awards, address changes, insurance deductions, stop actions, and a large

variety of ancillary actions. The documents representing this data input were for the most part manually prepared and only a very few were being typed. Amended awards, of which there are about 100,000 a month, were probably the most troublesome. The other large-volume inputs are original awards and changes of address. About 50,000 original awards are made monthly and each of these must be researched to make sure the claimant isn't already being paid—a number of these do come in, incidentally. Address changes run about 1,000,000 a year and each of these must be matched with the existing records.

After more detailed analysis it was estimated that if all of the data relating to a single veteran were brought together there would be an average of 250 characters of variable information for each veteran. The range ran from a minimum of 160 characters to a maximun of 800 characters and obviously could not be accommodated on a punched card with its 80-column straight-jacket.

Another important design consideration was speed in handling. No veteran wants to wait for his check when a payment is due him and he has been told a check will be forthcoming. Whatever system was evolved had to have a prompt lookup capability for the record of what a veteran is or is not getting, as the case may be, and permit paying more or stopping payment promptly. Basically, therefore, a computer system was required—one which could move a large mass of information and move it rapidly. A decision then was made to centralize the processing at one location and Chicago was selected as the city most suited for central processing, primarily because of its central location geographically and convenient transportation facilities to other parts of the country.

The interagency ramifications previously mentioned also were made a design consideration throughout the program. If the payment processing, check-writing and mailing workload could be spread over the full month, everybody's problems would be greatly simplified.

Establishing The Central Data File

Setting up one individual 250-character record is elementary but setting up 4,800,000 individual 250-character records becomes a staggering proposition. Where was the data to come from and

how was it to be assembled? Some of the basic information was scattered through various Veterans Administration records, some in Treasury records. Fundamentally, however, it had to come from seven different punched card files which had either never been reconciled or reconciled only infrequently. The payments files were an exception—these had been reconciled monthly.

Preconversion audits were instituted and a substantial number of errors were found and corrected before data was transferred to the computer. However the interrelationships among a number of items of variable data cannot be effectively checked through punched card processes. The actual transfer of data was worked out in phases and controls were established on the basis of the former payment records. When the various decks of punched cards were merged to form master records, discrepancies still remaining after the preconversion audits were listed and referred to the appropriate regional offices for correction on a time-available basis.

Postal facilities were and still are used for data transmission. Paper tapes and documents are generally airmailed to the data processing center in Chicago but regular mail service is used for data coming from nearby offices. Controls over the data are established in the regional offices and processing in the data processing center is balanced to these controls which originate in the offices taking the judgment action.

Computer Processing in the Veterans Administration

Computer operations are on a continuing basis in the Veterans Administration processing center. There is a bi-daily cycle for checking each new award action against the master record to determine whether the action proposed by the originating office is consistent with previous actions of record. This checking every second day minimizes waiting and permits rapid resolution of every claim received. At one time consideration was given to paying original awards without even looking to see if there already were a master record but the potential danger of overpayment seemed too great to warrant the risk, particularly in view of this extremely rapid processing cycle that is now a matter of routine.

Transactions coming to the data processing center are subjected

to three tests before being processed against the master record. The first test is to balance them against the controls to see that everything came in that should have come. The second test is an edit function—each transaction is checked for the requisite features of a transaction of its type. The third test is an audit function—the various pieces of information are machine checked for compatability with the awarded amount. It is only after input data meets these three balancing, editing and auditing tests that it is processed against the master file to determine whether payment is indicated.

If no barrier to payment is uncovered, vouchers are immediately produced for all amounts past due and for the amount due for the balance of the month. There also are produced the total payable monthly to each veteran and all accounting totals required for general ledger posting. Management and legislative reports of a statistical nature likewise come from this single set of records.

Conversion to computer processing is about one-third completed and there are now more than 1,500,00 accounts being paid from the data processing center in Chicago. Regional office control of input has reduced the error rate to less than one per cent. Input control tends to be overwhelming in the early period of computer operations, because of the tremendous volume of data pouring in, but the control is built into the computer itself and computers follow instructions much better than humans are capable of doing. If the instructions are good, the results are certain to be good and despite the improvement already achieved the target now is an error rate of one-tenth of one per cent.

At the current time a document originating, for example, at Los Angeles has been carried by mail, moved through the system in the data processing center and cleared through Treasury disbursing, all in seven days. Mail time is averaging about 1.3 days from all parts of the United States into Chicago. A daily transaction register is produced to provide a complete audit trail. The conversion program meanwhile is being pushed and should be completed within another year.

Treasury Disbursing Office Processing

Treasury disbursing procedures in Chicago are organized around an IBM–7070 computer which was delivered in November

1960 and commenced actual processing operations in early January of 1961. The first day of operations 140,000 checks were processed and one day in March processing volume rose to 654,000 checks in one 24-hour period, the highest volume achieved to date.

The disbursing computing system is rather simple compared to most systems. Its one unique feature is high speed checkwriting equipment, consisting of three high speed punches and seven printers. Each punch has the capacity to punch checks at the rate of 250 a minute and with three machines checks can be punched at the rate of 750 a minute. The printers are designed with dual feeds and each machine can handle two flows of 50 checks a minute or 700 checks a minute for the seven machine unit.

Computer processing in the disbursing office system consists basically of three computer runs: file maintenance, distribution, and printing and punch. In file maintenance, the transaction tape forwarded from the Veterans Administration is used to update the magnetic payment file. Based on the 1,500,000-account experience to date, it is expected that the completed system will involve 250,000 payments daily and the daily transaction tape will carry approximately 20,000 items. The file maintenance run will take 25 minutes. A second basic run is made to edit and distribute the permanent records on tape so that checks can be punched and printed on the high speed punch and printing equipment simultaneously. This run will require approximately 70 minutes daily to handle the projected 250,000 payment items.

During this edit and distribution process check numbers are assigned to the records on tape and a rather interesting combination of output tapes is produced. Most veterans have a three-line address but some have four, five and more lines in the address. The computer is programmed to collect three-line addresses on one tape, four-line addresses on another tape and so on. The reason for this grouping lies in a desire to obtain maximum utilization out of the printing cycle. A complete cycle is lost if there are a three-line check on one side and a four-line check on the other side. Hence two checks having the same number of lines are always printed together.

The third basic run is the one to punch and print the checks.

Punching and printing are accomplished on separate equipment and about seven and a half hours will be required to process the eventual veterans workload of 250,000 checks. The complete three-run sequence of file updating, editing and distribution, and printing and punching can be accomplished in less than nine hours at the 250,000 check volume level.

Following preparation of the checks is a combination microfilming operation. In this operation the check is microfilmed, the disbursing officer's signature is affixed to the check and the check itself is dated, all simultaneously. Next the checks are sorted geographically into categories by states and the 47 largest cities within the states.

An important by-product of the computer processing is the matrix tape, a tape which shows the disbursing officer's symbol, check number and amount. This matrix tape is forwarded to the Treasurer of the United States for use in reconciling checks that have cleared through the banking system. Check reconciliation is accomplished by computer and this magnetic tape in matrix form provides the data needed to detect immediately any fraudulent changes in check amounts.

Another important by-product that has been evolved is a duplicate of the microfilm which is sent back to the originating regional office in the Veterans Administration. This arrangement not only is resulting in savings to the Treasury and the Veterans Administration, by keeping check inquiries out of Chicago, but more importantly gives these regional offices the data they require to handle check inquiries promptly. It also permits them to have essentially the same information they had when they performed the processing themselves, prior to centralization.

Mailing Procedures

The final step in the disbursing office processing sorted the payment checks into 97 categories—one for each of the 47 largest cities and one for each of the fifty states. Postal employees assigned to the disbursing office pack the checks into sacks labeled for various destinations throughout the United States. The major portion of this volume is then immediately transported to the various railroad stations in Chicago, or where airlift is authorized,

to the appropriate airport. These procedures obviate the need for manual sorting and are expected to result in savings within the postal establishment approximating $100,000 annually.

Postal representatives worked with joint Veterans Administration and Treasury teams in the planning stages to determine the most advantageous premailing sort. They reviewed the computer program for sorting to eliminate possible errors that might result from similarities in post office names or other postal peculiarities. They also provided a detailed monthly dispatch schedule showing the date and time checks for specific locations would have to be available to insure delivery on the desired date.

When implementation of the program began on a phased basis, postal participation was accelerated. The initial machine distributions were manually verified and errors photographed by means of Recordak to inform Treasury and the Veterans Administration of what was going wrong so that corrective action might be taken. Whenever there was a variation from normal dispatch schedules, postmasters at destination points were alerted by telephone or telegram. Special handling arrangements were worked out to insure delivery when complications arose because of strikes, blizzards or train withdrawals. Airmail delivery was authorized without additional cost to Treasury or Veterans Administration where because of temporary problems airmail handling was needed to insure delivery by the desired date.

Workload Cycling

Planning to spread the payment processing, check-writing and mailing workload over a full month has been completed but actual cycling steps are being deferred until conversion to computer processing is itself completed. Already, however, the Administrator of Veterans Affairs has given formal approval to the cycling plans and this approval has the unqualified concurrence of the Treasury and Post Office Departments. When cycling is commenced, veteran and dependent beneficiaries will be grouped according to claim number in much the same manner that cycle-billing operates in department stores. A veteran with a claim number ending in 09, for example, would have his benefit accrued through the fifth of the month and be paid then. One with a claim

number ending in 19 would have his benefit accrued through the eighth of the month and be paid then. This will eliminate the cost of keeping current with all actions throughout the month and of course greatly ease the burden in the Chicago Disbursing Office and on postal facilities.

Editor's Note: In response to a Symposium question regarding cost of these procedures, Mr. Mock indicated that the original conversion schedule contemplated 18 months for conversion in lieu of the three years now planned. Over this period, he stated, some costs have increased substantially but others show substantial decreases. The expected breakeven point for recouping the investment being made in these procedures will come around 1964 according to the best estimate Mr. Mock could give. He pointed out, however, that any such estimate was necessarily more conjectural than otherwise and should not be regarded as very definitive.

ON FEDERAL PAY

It is time, I believe, for us to face the pay issue seriously. If we must spend close to 90 billion dollars this year—and look forward, as Senator Byrd predicts, to budgets in excess of 100 billion dollars in the decade ahead—we should take the steps necessary to manage this vast and increasingly complex enterprise with at least the equivalent skill and ability we expect in banking, in industry, in the management of law firms and labor unions. I have no quarrel with some differential favoring the private economy. I believe in the efficacy of patriotism and the inherent interest of public affairs to help attract men to Government service. But the size of the salary differential which now seems to exist seems to be so large as to make it quite difficult to attract and hold the ablest administrators, scientists, and technicians in those crucial jobs in the higher levels of the career service. Everyone interested in the effective management of the public business should, I think, ponder this problem.

. . . Budget Director David E. Bell in a September Address at the Annual Conference of the Life Office Management Association

An Interagency Panel

Accrual Accounting and Cost Budgeting

Increasing affinity between government and industry in recent years has undoubtedly been a significant factor in the encouragement given Federal agencies to use accrual accounting and prepare budgets on a cost basis. Accrual accounting and cost budgeting were advocated by the Second Hoover Commission and adopted by Congress five years ago in Public Law 863 of the 84th Congress. The diverse views expressed by Messrs. Kelly, Corso and Noble merit the attention of everyone interested in Federal financial policies and practices. They appear here in the order in which they were presented during the Symposium Session.

A Critical Appraisal

By James F. Kelly

It is my understanding that back in 1954 or 1955 the Hoover Commission was told a story that went something like this: an elderly man who was dying and quite worried about the hereafter, called in his three sons and expressed concern as to what the hereafter would be like. In order to make certain that he would not be in want on his way to the hereafter, he exacted a promise that at the time of his death each of them would deposit a hundred dollars in his casket. Shortly thereafter he died and his three dutiful sons came to the funeral parlor to pay their last respects. The first solemnly approached the casket and deposited a hundred dollar bill. The second did likewise. Then the third, with equal solemnity, approached the casket and placing there a check for three hundred dollars, withdrew the two hundred his brothers had deposited. I cannot vouch for the authenticity of this story but it does perhaps explain how the Hoover Commission conceived its four billion dollars in savings if only we were to change our bookkeeping. I do not believe in these

savings and I have never heard anybody seriously contend they were possible.

The Hoover Commission took the approach that what is good for business is good for government and in their recommendations promulgated the concept that Federal agencies should no longer use the systems of accounting evolved to carry out public purposes. They conceived of a new system which they advertised would save money and give the Congress greater control over the purse strings. It is my view that they were mistaken in both of these matters.

It now becomes necessary for me to violate a basic principle I have observed for a great many years—never to discuss religious issues. But accrual accounting and cost budgeting have unfortunately become a religion. You are either a defender of the faith or an agnostic. This, I think, is unfortunate. I think the defenders of the faith have striven too hard to defend a concept that is worthy of defense, but not as an end in itself. I think the agnostics are unfortunate in having taken a position that change is bad and that anything good for business is not good for government.

I should like here to emphasize two things: first, that we should be wary of uniformity, and second, that we should rethink the processes which lead us to believe that the systems of management should be the systems upon which we conduct relationships between the Executive Branch and the Legislative Branch in the funding of public service. It is in these respects that I believe the Hoover Commission was in error in their recommen-

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MR. KELLY

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dations in 1955. I do not quarrel with their advocating accrual accounting and cost budgeting as significant tools of management, but I do take issue with their advocating accrual accounting and cost budgeting as a tool for Congressional control of the purse strings. I also take issue with their position that these should become a uniform system applicable to the entire Federal Government. In both of these matters I believe there is considerable room for disagreement. I think it is ridiculous that whenever the Department of Defense has an accounting problem, the American Battle Monuments Commission must change its system of accounting.

Will it ever be possible for anybody in the General Accounting Office, or the Treasury Department, or the Bureau of the Budget, to design an accounting system that will apply to the myriad of responsibilities that exist throughout the Federal Government? There is not a textbook in existence, to my knowledge, that takes the position we should have one accounting system for all industry, from mining and manufacturing industries to banking and service industries. Almost any enterprise in industry in this country has its counterpart some place in the Federal Government. Therefore, I do not believe we shall ever evolve a successful system for the Federal Government that is uniform in its principles and in its procedures and in its details for every Federal agency.

Although I think it important not to accept accrual accounting and cost budgeting as a faith but rather as a tool, I should like to make it clear that I believe there are areas in the Federal Government's operations where it would be excellent to apply these systems. I do think that their application should be tailored to fit the particular program. I also think that the professionals in this field should so know their programs, and should be so closely associated with management, that they can tailor a system that management wants, that management needs and that management can use.

It is a mistake, however, to concede that a system tailored to assist the manager in the performance of his role of providing public services in the most efficient and economical manner should also become the system through which the Congress of

the United States performs its role as a board of directors. The Hoover Commission Reports place great stress upon this as being a method by which the Congress could obtain better control of the purse-strings. These reports unfortunately are another example of how people are led to the false conclusion that the way to reduce the Federal budget, the way to eliminate deficits, the way to produce surpluses, the way to reduce taxes, is to change the system of budgeting, or to change the system of accounting, or to change the system of auditing, or to change something else procedural. Procedural changes will never reduce Federal expenditures. There are only two things which will: one, the provision of less services, and two, the use of techniques whereby managers become more proficient in the conduct of the services for which they are employed.

The Executive Branch should assume full responsibility for the management of the Executive Branch and should bring into play all of the tools that can be employed to assist in performing this function more effectively. The Congress of the United States should be the watchdog. Its job is the provision of funds. The public service differs from the non-public service in that the Constitution requires that no official of the Federal Government commit in a binding form present or future expenditures from the Treasury of the United States except pursuant to an appropriation.

The Constitution and the statutes define an appropriation as a grant of authority beyond which officials of the Executive Branch may not go. Thus a budget is not a cost statement, nor is it an accrued expenditure or a liability statement. It is a funding statement. It is a request for a grant of authority from the Legislative Branch. The statement that a prospective borrower provides a bank is not necessarily an income and expense statement or a financial statement. It is a statement of fund requirements drawn from these documents, as distinguished from the documents themselves.

I think it is most unfortunate that the Government Operations Committee of the House of Representatives and the corresponding committee in the Senate sponsored the legislation that has been enacted as Public Law 863, 84th Congress, dealing with

cost-based budgeting, and Public Law 85-759, dealing with accrued-expenditure limitations. The most significant opposition to this legislation came from the Appropriations Committees of the Congress when the proponents of the legislation sought to persuade the Congress that it could have better control over the purse strings if budget documents were submitted in a particular format. The people to whom they were going to be submitted said, "Don't give us the documents that way. We don't want them that way." But the Congress passed the law notwithstanding and we since have experienced great difficulty in producing the documents to conform to that law, not in places where it was good but in places where it made no sense. And the Congress has said, "Well, that may be the way the President's budget was printed, but when you send us the justifications, don't send them to us in that form. We want it on an obligation basis. We want to know how much money you need. We want to know what grant of authority you are requesting."

I think that all of us would do well to think of accrual accounting and cost budgeting as a tool to be selectively used. The very attempt to gain uniformity in its utilization has made the tool suffer. We now have the term, "accrued expenditures." We have tables with respect to every appropriation in the Federal Government developed in this form, but without substance or meaning. In some cases, we have included depreciation. In some, we have included accrued annual leave. We have on occasion even accounted for it on a day-to-day basis. In other cases, we have included none of these. We have made a pro-forma application and termed it an accrued expenditure limitation, but no manager in the organization knows what the figures mean. The budget office does and the accounting office does but this serves no useful purpose.

Our purpose should be to serve management in a way management understands, one that helps it do a more capable and more proficient job.

Application in the Atomic Energy Commission

By Victor Corso

While the Atomic Energy Commission is no stranger to controversy, its financial management system is one that satisfies both the Congressional Appropriations Committees and its own management needs. To understand this system, it may be well to look at the programs and organization and method of doing business in the Atomic Energy Commission.

The Commission is responsible for the procurement of uranium, the raw material which is basic to practically all of its operations. It transforms this uranium into a radioactive material known as U 235 in government-owned gaseous diffusion plants—at Oak Ridge, Tennessee; Paducah, Kentucky and Portsmouth, Ohio—or it synthesizes uranium into plutonium, which is also a radioactive material, in its production reactors at Hanford, Washington, and Savannah River, South Carolina. These radioactive materials form the active ingredients, or fuel elements if you will, for reactors used for the production of civilian power or for the propulsion of ships, missiles and rockets, and are the active ingredients as well for nuclear weapons. The Commission also conducts research and development looking toward nuclear reactor or radioactive isotope applications for military and civilian uses, and general research in the biological and physical sciences.

Most of this work is performed by contractors in government-owned facilities and most of these contractors are responsible for the conduct of a number of the Commission's programs. We fund these contractors in the amount required to recover their costs, as well as their changes in inventories and other assets, and their changes in commitments. In other words, we obligate one amount for a contractor. Now if we were to have an obligation presentation and try to reflect the application, use and need for funds for future years in terms of logical and meaningful programs for which the Atomic Energy Commission is responsible, the alternative would be to have an obligational amount for each program. In order to do this, we would have to

make some arbitrary proration of inventories and other selected resources to each of these programs because we couldn't know how these resources would be used until they were consumed. Therefore, an obligational breakdown on a program-by-program basis couldn't be either very accurate or very meaningful.

Our compromise is to measure these program activities of our contractors on a cost basis, reflecting the services performed or goods received. We reconcile these costs to obligations by taking changes in inventories and other working capital items for the contractor as a whole. The costs are broken down on a product basis, which is necessary because the Commission provides certain goods and services to the public for which charges have been established. Since cost accounting was a prerequisite for pricing our services to outsiders, it made good sense to develop a compatible cost-based budget and reporting system. In other words, we wanted to obviate the need for two accounting systems.

Furthermore, the Commission has among its programs many development projects which have very long lead times, in the order of three to five years. Before the Commission can make an intelligent management decision as to whether it should prosecute one of these programs, it should know what the total cost will amount to. It should also have a system that will enable it to review progress on a physical or actual work basis as well as on a financial basis, to ascertain whether the progress is in keeping with the target and whether the dollars that were planned for this program are realistic in terms of actual experience. Again

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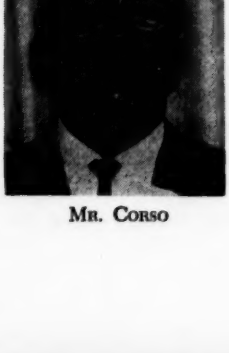

MR. CORSO

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reporting in terms of accrued costs is a requirement, if the Commission is going to have this kind of management tool.

The Appropriations Committees recognized the logic of this approach after a short period of indoctrination—particularly of the staff of the Appropriations Committees—and accepted the fact that cutting a dollar in cost, where they want to exercise their judgment on the level of a particular program, is equivalent to the cutting of a dollar in appropriations. It is obvious that if we were to keep faith with this commitment to the Committee, we had to exclude depreciation from cost. When depreciation is included in the cost of a particular program, reductions cannot be made on a dollar-of-cost for a dollar-of-appropriation basis. We would have to tell the Committee, "No, you can't cut the appropriation by a hundred dollars, because twenty five of these dollars are depreciation and we've already got the facilities in being. They don't require appropriated dollars." So, in order to give Congress a program-by-program review of dollar levels required, we exclude depreciation in our budget presentation.

We also find this system a great help in the administration of funds once we receive our appropriation. After apportionment, our Central Budget Office issues financial plans for each of the Field Offices of the Commission. The Field Offices in turn make subsidiary financial plans which are given to each of the operating contractors. These plans set forth, for each contractor, the cost level budgeted for the year by program. The total costs for the contractor are reconciled to the amount obligated by entries for changes in selected resources. Upon receipt of the financial plan, the contractor distributes the planned annual cost by months. These monthly projections are reflected in our financial reporting system and actual costs are reported against the monthly projections. This gives us a tool for evaluating program status, for each monthly report shows whether a program is on schedule, ahead of schedule or behind schedule, at least in terms of dollars. Admittedly we must look behind these dollar deviations from planned costs, to the physical aspects of the contractor's operation, to make sure that the overruns or underruns do not result merely from the fact that things are costing more or

costing less but do, in fact, represent deviations from planned program accomplishment.

Although these procedures that have been outlined work very well for our annual operating expense appropriations, we take a somewhat different approach under our plant appropriation. Most of our construction projects are let on lump-sum fixed-price contracts and we have found it to our advantage to express construction requirements in terms of obligations. This full funding approach is better both from the standpoint of internal management and in explaining our programs to Congress and to the Bureau of the Budget. The Congress seems to be well satisfied with this and knows that once it has appropriated money for a project there are no mortgages on future appropriations. The particular project has been fully taken care of.

The Commission also finds this to its advantage, in that it can see at any one time what the prospective facilities are going to cost and how large its total investment in facilities will be, and it has the funds in hand to meet commitments. Costs are used, however, in administering the construction budget. We estimate the amount of cost that will be incurred in any given fiscal year and call for monthly projections of these costs, which should reflect the actual progress under a given construction project. When our monthly reports come in, the actual is compared with the projection. This flags areas where substantial deviations may signify either trouble in meeting the targeted rate of completion or inaccurate cost estimating. The important thing is that it provides an effective basis for monitoring our construction operations.

These two financial management systems, one for operations and one for construction projects, have been well received by management. They are understood by the Appropriations Committees. We think they meet some of the objectives the Hoover Commission had in mind in recommending accrual accounting and cost budgeting, particularly with respect to congressional control of the funding and level of operations of the Atomic Energy Commission.

Proposed Application in the Post Office

By Lindsley H. Noble

It is encouraging that Mr. Kelly refers to the supporters of the two sides in this controversy as "believers" and "agnostics." It is encouraging also that he excludes atheists who are much harder to handle. Agnostics have an open mind and there is some possibility of converting them. And even some who have religion can perhaps update their beliefs to advantage.

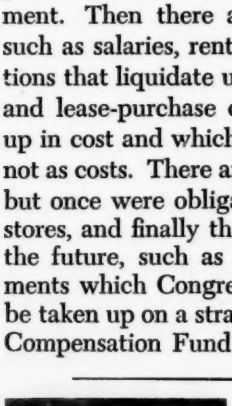
The system for the Atomic Energy Commission which was outlined by Mr. Corso is already in being and operating. We have in being in the Post Office some ideas that as yet have not been approved by the General Accounting Office or the Bureau of the Budget. In our operations we can integrate cost accounting with obligation accounting in a relatively simple manner that we believe will make accrued costs more palatable to Congress and more understandable to our own management, and still retain the advantages of both.

We are fortunate in the Post Office in that about 78 per cent of our costs are payroll costs where, except for accrued leave, costs and obligations are synonomous. Another 15 per cent of cost is transportation and here again costs and obligations are synonomous. The same applies to rents and utilities which account for about 3 per cent of our budget. This leaves only about 4 per cent of our expenditures where the difference between accrued costs and obligations is well marked, namely in our capital program, in our research activities and in our major supply procurement.

While we do not have currently a complete cost budget, we are actually using many of the tools of accrual accounting because we control three quarters of our funds in terms of manhours and relate them to workload. In the postal clerk account, we measure the manhours expended and compare them with the number of pieces of mail handled. We review our city carrier costs in terms of number of stops. We have been using accrued cost in our motor vehicle accounting and mail equipment shops for some time.

What we want to do now is to include accrued costs in our budgeting but at the same time continue to present to Congress our obligational requirements. As Mr. Kelly states, Congress needs to know the general purpose for which funds are being requested. The committees have a right to know how the obligational authority which they are granting has been or will be applied in terms of activities and programs, as well as costs. They also are entitled to know something about the unliquidated obligations in terms of activities and programs to which they relate, rather than have them presented as an amorphous mass described as a net change in unpaid undelivered orders.

We think this can be done, at least in our type of operation, by distinguishing clearly in our account structure between the various types of obligations and costs. There are obligations that precede cost, for example, orders placed for supplies and equipment. Then there are obligations that are concurrently costs, such as salaries, rents and transportation. Also there are obligations that liquidate unfunded liabilities, such as for accrued leave and lease-purchase commitments, which were previously taken up in cost and which now have to be reported as obligations but not as costs. There are costs that are not concurrently obligations, but once were obligations, such as depreciation and issues from stores, and finally there are costs that will become obligations in the future, such as accrued leave and lease purchase commitments which Congress will not let you fund but which need to be taken up on a straight accrual basis. Sums due the Employees' Compensation Fund under the new law are also of this nature.



MR. NOBLE

Lindsley H. Noble is Deputy Assistant Postmaster General and Controller of the Post Office Department. Mr. Noble's broad experience in the accounting and controllership fields includes Comptroller of the Panama Canal Company, Controller of the Atomic Energy Commission, and Division Head in the Office of Price Administration's professional accounting staff. A certified public accountant, Mr. Noble has to his credit six years in public accounting and five years in private industry.

By proper account classification, we think these differences can be distinguished and coded, so that we can get a tab run of obligations and prepare the conventional obligational statement —in terms of activities. This requires an activity for inventory procurement, since the purchase of supplies cannot be distributed to the end program, but we think we should know what we are obligating in the way of inventory items. We can also get a tab run of accrued cost in the conventional cost accounting method and in that we would include the obligations which are currently accrued costs.

What we are proposing that I think is new—at least I haven't seen it before—is to treat obligations that precede cost as though they were assets on the debit side and liabilities on the credit side. If you wish, you can eliminate the two and have a conventional commercial balance sheet, but we feel it would be very useful to carry them on the balance sheet as resources on order, broken down into such categories as inventories, capital items and research commitments, in a presentation that should be very informative to management and to the Congress. After all, assets have been defined as potential services.

Carrying that a step further, we think the balance sheet should be split into two parts, into (1) a fund balance sheet and (2) what might be called a cost or non-fund balance sheet. Thus, when a "liability" is set up for an obligation it reduces the unobligated appropriation balance and the fund balance sheet thus remains in balance. Cash and cash resources on the one side offset true liabilities, undelivered orders and unobligated appropriation balances on the other side to complete the fund balance sheet. But items that are on order, which are the unliquidated obligations, are concurrently moved down to the asset side of the non-fund balance sheet, where they will be accounted for when and as they become costs and when and as they are consumed. When these are brought down, the equity therein also is brought down, corresponding to the reduction in the appropriation equity on the fund balance sheet, and thus keeping the non-fund balance sheet in balance. In addition the non-fund balance sheet would carry inventories and fixed assets on hand and unfunded liabilities.

This is a very brief summary of the concept, but we feel it ought to work. Under this concept we account for the appropriation on an obligation basis. Then we bring the amounts down into the cost balance sheet and there account for them as they move into assets and from assets into expense and get written off. To simplify matters, we want to make two exceptions, which will considerably reduce the work without significantly distorting the cost figures from a theoretical viewpoint.

Minor items of supply normally are charged off at the time they are received and are not carried into inventory. Instead of expensing them when they are received, to eliminate unnecessary work we propose to expense them when they are obligated. That may sound very unconventional, perhaps even shocking, but it is purely a convention that they be written off when received. Theoretically every item—every lead pencil and every paper clip one has on hand—should never be written off until it is consumed. But there is a line beyond which it is impractical to attempt to carry an item in inventory, so why not write these items off when they are obligated and thus eliminate the work of having to move them into cost when they are received. From a management and Congressional viewpoint, the commitment has been made and the money is gone—and it does greatly simplify the work to do this. The difference between the amount undelivered from one year-end to another would be so insignificant that we think cost would not be distorted from even a purely theoretical viewpoint.

We also think it would simplify matters if items were treated as cost and moved from unliquidated obligations into assets on hand at the time payment is made. If payments are relatively current, most of the bills are paid within the accounting period in which the receiving report falls and it does save work to make the entry at the time the payment is booked. If there are any large items outstanding at the end of the year, received but unpaid, they can be taken up and moved into assets on hand. But from month to month it does not serve much management purpose to know exactly how much equipment was delivered or supplies actually placed in inventory, so long as they are already in the balance sheet as on order.

We feel it is important to have accrued costs, that they serve a useful purpose in measuring what has ultimately become of the funds, but we can also see the viewpoint of Congress and recognize the need to record obligations currently and control them. The Antideficiency Act quite properly requires that obligations be controlled and we must keep track of them as they are incurred and make our allotments in these terms. What we want is the benefits of both systems and we think what has been here outlined provides it.

INTERNAL REVENUE COMMISSIONER CAPLIN URGES

. . . cooperation of all persons who prepare Federal tax returns, particularly professional practitioners, in filling out tax returns as nearly as possible in accordance with the official forms. Adherence to official forms becomes increasingly important as the Internal Revenue Service moves into its automatic data processing program. This program will be inaugurated throughout the Atlanta Region at the beginning of 1962, and will be gradually extended to other regions.

Efficient processing requires that vast amounts of data be transcribed from returns on an assembly-line basis. The system's success depends upon the ability of clerical personnel to make such transcripts rapidly and accurately. This in turn requires that entries be made on the tax return in consistent form and sequence; otherwise much slower and more expensive editing by technically qualified people would be required.

Another consequence of automatic processing will be a marked increase in the use of preaddressed forms. Studies are now being made to determine the advisability of preprinting the names, addresses, and identification numbers on the actual blank forms or in other kinds of documents (which would then be attached to the return.)

An Army Panel

Army Command Management System

Four Department of the Army representatives describe how the Army integrates programming and budgeting with management authority and responsibility at all echelons under a system identified throughout the Army as ACMS, for Army Command Management System. Financial flexibility, current and accurate program data, coordinated performance and financial reporting, and continuous evaluation of performance in terms of related costs are important features of this widely discussed system of integrated program and budget management. Cost-based budgeting techniques form the underlying procedural structure which gives dependability to data employed in decision-making processes.

Integrated Management

By Laird G. Morris

In basic concept, the Army Command Management System is an approach to integrated management which fuses programming, budgeting, accounting and reporting with manpower and supply control into a single Army-wide system of management, in order to provide an opportunity for better management. It is a system that operates through command channels and therefore is a system of command management. Under this system command decisions at all echelons are based upon coordinated staff recommendations developed as a result of thoroughgoing review and analysis processes conducted throughout the Army. Modern cost-based budgeting techniques are utilized extensively in these and other programming and budgeting processes to provide the factual data upon which sound decisions necessarily depend.

The principal features of this integrated system of programming and budgeting, and of its underlying cost-based budgeting techniques, are best understood in terms of their application at installa-

tion level—the focal point of Army operations. For this reason Fort Hood has been selected to illustrate the more important methods and procedures employed by the Army in its cost-based budgeting under the appropriation, "Operation and Maintenance, Army." Fort Hood's position is that of a major field installation with important combat training and support responsibilities; thus it is at the operating level in the Army's chain of command.

Fort Hood

Fort Hood was first activated in 1942 and is currently the home of the Second Armored Division. Located in Central Texas, Fort Hood comes under the Fourth Army for command purposes and covers an area of 322 square miles. It has a military population of 24,000 and its annual funded operating costs exceed $30 millions.

Operating and managing an installation the size of Fort Hood is no small task. In keeping with the Army concept of command, overall responsibility for operation and management is vested in the Commanding General, who in this instance is also Commander of the Second Armored Division. Under the Army Command Management System, a commanding general is given maximum authority and commensurate responsibility to manage, within the guidance and resources provided by the next higher headquarters, which for Fort Hood is the Fourth Army.

Assisting the Commanding General is the Deputy Post Commander, who relieves the Commanding General of most of the problems relating to the administration and operation of Fort Hood and its satellite installations. Further assistance is provided

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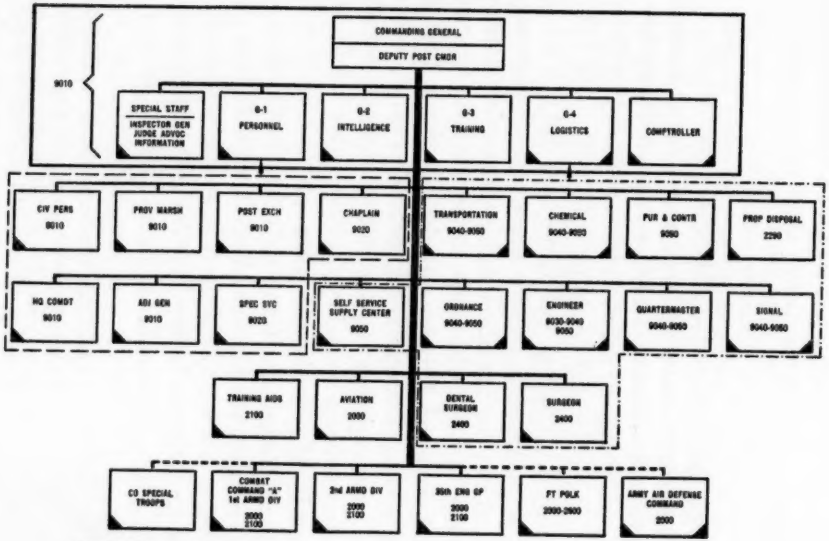
MR. MORRIS

Laird G. Morris is Chief, Budget Systems Branch, in the Office of the Comptroller of the Army. Mr. Morris has served twenty years in various positions in the Department of the Army, principally in budgeting, and has had a major role in developing advanced management systems within the Army. He received his basic education at the Beacon School of Business in Delaware and at McCoy College in Maryland.

FORT HOOD ORGANIZATION



The four-digit budget codes associated with organizational units on the chart identify applicable budget programs:

2000—OPERATING FORCES
2100—TRAINING ACTIVITIES
2200—CENTRAL SUPPLY
2400—MEDICAL ACTIVITIES
2500—ARMY-WIDE ACTIVITIES
2600—ARMY RESERVE AND R.O.T.C.
2800—INTELLIGENCE ACTIVITIES
2900—COMMUNICATIONS
9010—HEADQUARTERS COMMAND ADMINISTRATION
9020—RELIGIOUS AND WELFARE
9030—REPAIRS AND UTILITIES
9040—FIELD MAINTENANCE
9050—LOGISTICS SERVICES

by five major staff agencies and a group of three small administrative offices, the latter headed by the Inspector General, the Judge Advocate and the Information Officer. The small triangles in the lower left and right hand corners of the organizational boxes shown on the accompanying chart indicate, respectively, concern with costs and with obligations. Concern with costs predominates because operating units exercise control over the consumption of resources, which is in terms of costs, but do not control the procurement of resources, which is in terms of obligations.

Organizational Responsibilities

Of the major staff assistants, only the Logistics Officer (G-4) and the Comptroller deal in both costs and obligations. The Intelligence Officer (G-2) and the three small administrative offices shown on the upper left section of the chart deal only with the costs of their immediate offices. The Personnel Officer (G-1) and the Training Officer (G-3) have major program responsibilities but likewise deal only with costs. The Personnel Officer's program and budget responsibilities include all headquarters and administrative-type activities and organizational units while those of the Training Officer encompass all tactical and training (referred to as *mission*) activities of the installation.

The Logistics Officer (G-4), being responsible primarily for inventory management and for the management of all contracts for the operation and maintenance of facilities, is of necessity concerned with both costs and obligations for these areas of responsibility and the Comptroller of course is concerned with costs and obligations for the installation as a whole. Officially the responsibility for remaining within the installation's assigned obligation ceiling is centered in the Comptroller's Office.

The various technical services shown on the right of the chart function as inventory managers. Two of these—the Quartermaster and Medical (Dental Surgeon and Surgeon)—operate under revolving stock fund procedures and hold their station supplies in stock-funded accounts. The other five—Transportation, Chemical, Ordnance, Engineer and Signal—are responsible under the Operation and Maintenance appropriation both for the costs of their own operations and for obligations for the procure-

ment of installation inventory. The technical services provide overhead support for the different primary or mission activities located on or satellited on the installation but their costs cannot be related directly to any one budget program and therefore must be allocated on some reasonable basis to the various benefiting programs.

General Budgetary Guidance

Approximately 14 months prior to the budget year, Department of the Army Headquarters issues to the larger major commands (European Command, Pacific Command, Continental Army Command, etc.) preliminary program and budget guidance, providing the best available planning information as to projected programs and the expected dollars to carry them out. Each major command in turn submits a commander's statement and budget summary, showing the projected use of these expected funds and the impact on the command of any dollar deficiencies which might preclude carrying out assigned missions. These commanders' statements and budget summaries are used by Headquarters, Department of the Army, as a double check on the Army budget being developed by the Headquarters staff and as a means of obtaining each major commander's appraisal of the situation as he sees it.

When the President's budget is finalized, Army Headquarters revises the preliminary program and budget guidance for these major commands and initially prepares program and budget guidance for all other commands and agencies which report directly to Headquarters, Department of the Army. This starts the apportionment phase and the phase in which the field commands begin to fully participate in the budget cycle. Based on this guidance, commands and agencies prepare and submit their operating programs and budgets for the budget year.

Fort Hood and the Second Armored Division receive their specific program and budget guidance through the Continental Army Command which provides for each of its Armies guidance similar to that published by Army Headquarters, with each Army in turn providing the necessary guidance to all subordinate installations such as Fort Hood. As soon as the Commanding General of Fort Hood receives this guidance from the Fourth Army, it becomes

his responsibility to develop detailed program and budget plans for his command for the coming year.

Summary

Programming and budgeting are conducted throughout the Army as part of an integrated system of management known as the Army Command Management System. This system makes full use of the Army's chain of command and all echelons participate in the decision-making processes out of which Army programs evolve. Cost-based budgeting techniques have been a major contributing factor to more informed program management, but the greatest strength of the system undoubtedly lies in the coordinated active and knowledgeable participation it promotes among all responsible echelons of the Army.

Programming at a Representative Installation

By Fletcher D. Mitchell, Jr.

Most Army installations have found through experience that *advance* planning for the budget year is essential if the various subordinate units at the installation are to have sufficient time to develop their respective elements of the installation's Operating Program and Budget in appropriate detail.

Fort Hood follows this practice and early in April preceding the budget year being considered issued an internal directive calling for budget estimates to be prepared on the assumption that funds and missions would continue generally at current levels. This internal directive established a time table of actions to be taken and required the Personnel, Training and Logistics Officers—Fort Hood's major program directors—to submit to the Comptroller by May 15th detailed data in support of the installation's Operating Program and Budget.

On the basis of this guidance, each major program director met in turn with his subordinate program directors to develop the individual segments of his Operating Program and Budget.

Detailed Planning Procedures

In developing his program plans, for instance, the Training Officer met with his 15 subordinate program directors to give them direction on developing their various elements of the operating budget. These program directors then coordinated with the different technical service inventory managers, advising them of changes in plans, supply requirements and nonrecurring demands, and determining from them supply and equipment availabilities in order to time phase their costs by quarters.

Eventually the Training Officer received from each of his program directors a supply schedule and a workload and cost schedule showing labor, supplies and services programmed. After evaluation and approval of these schedules, the Training Officer forwarded his consolidated supply schedules to the appropriate technical service inventory managers, through the Logistics Officer, and at the same time forwarded his consolidated workload and cost schedule to the Comptroller.

The Personnel and the Logistics Officers followed similar procedures for the operating programs under their jurisdiction and forwarded to the Comptroller a similar-type consolidated workload and cost schedule covering their respective programs. Being responsible also for inventory management and for contracts involving operation and maintenance of facilities, the Logistics

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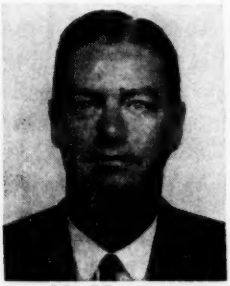


MR. MITCHELL

Fletcher D. Mitchell, Jr., a member of the staff of the Comptroller of the Army since 1953, has had extensive experience in military budgeting and in 1960 was awarded the Army's Meritorious Civilian Service Award for his role in designing, developing and refining the Army Command Management System. Mr. Mitchell first entered Federal Service in 1941 and served in various positions in the Office of the Secretary of Commerce until 1946 when he became Executive Director, Overseas Operations in Germany. From 1947 to 1953 he served as Director of Budget and Finance, first for the Office of Military Government in Germany and then for the High Commissioner to Germany. In 1942 he received the degree of bachelor of law, with distinction, from National University (now merged with The George Washington University Law School).

Officer prepared additional schedules analyzing procurement and inventories on an installation-wide basis and forwarded them to the Comptroller by May 15th, for use in evaluating the collective programs being considered. The Comptroller thus had by May 15th all of the basic data needed to compile a preliminary budget for the installation and he proceeded promptly to assemble the data for overall evaluation.

Program and Budget Advisory Committee

Meanwhile Fort Hood had received its detailed program and budget guidance from the Fourth Army late in April. This guidance was referred to the installation's Program and Budget Advisory Committee for evaluation along with the preliminary operating budget compiled by the Comptroller from the consolidated workload and cost schedules he had received. Similar program and budget advisory committees are established at most installations to provide for integrated program and budget actions. At Fort Hood the Deputy Post Commander is chairman of the Committee and the other members are the Personnel, Intelligence, Training and Logistics Officers, plus the Comptroller. This Committee develops coordinated staff recommendations to the Commanding General to insure balance among all major programs and installation-wide operation and maintenance of facilities.

In carrying out its responsibilities, the Committee applies the current official program priorities, develops plans for the allocation of resources, and evaluates the reasonableness of the balance in station inventory on hand and on order. At the same time, however, each member of the Committee retains responsibility for supervising his own operations to insure compliance with approved program schedules, standards of performance and utilization of resources.

The individual members of Fort Hood's Program and Budget Advisory Committee studied the impact of possible changes required in the preliminary Operating Budget as a result of the Fourth Army guidance and prepared detailed recommendations for decision at the next committee meeting. At this meeting, the Program and Budget Advisory Committee adjusted the preliminary Operating Budget to conform to Fourth Army guidance,

after which the recommended Operating Budget was referred to the Commanding General for his approval. When this was given, the Comptroller assembled the Operating Budget and forwarded it to the Fourth Army.

Revision of the Preliminary Budget

The budgeted amounts before and after Committee action are shown in the table presented on page 107. The amounts in the first column are a composite of the totals requested by the major program directors and the column total of $32,593,000 represents program consumption requirements for the budget year. The second column, summarizing Fourth Army guidance, includes data on inventory changes and changes in orders outstanding but most importantly it reflects the amount established for total obligations, $27,867,000. This latter amount was the only limitation imposed by the Fourth Army and represented a ceiling on the total obligations which could be programmed by Fort Hood. In its budget reprogramming, therefore, the Program and Budget Advisory Committee could not exceed this total amount but within this total the different program elements might be varied from the corresponding amounts scheduled by the Fourth Army.

The actual program developed by the Program and Budget Advisory Committee did exceed the Fourth Army's proposed total costs of $29,360,000, being more than $1 million higher, but compensatory decreases were made in outstanding order and inventory balances to keep within the mandatory $27,867,000 ceiling. These carryover resources are difficult to relate to any one program and for that reason are projected only at the appropriation level. Individual program requirements which could not be accommodated within the directed ceiling were presented to the Fourth Army in the form of a priority schedule and totalled the $5,153,000 shown as unfinanced in the fourth column of the summary budget table.

Use of Performance Factors

Although the detailed procedures followed in programming are too extensive to be covered here, they are characterized throughout by a concurrent programming of cost and performance. In a

FT. HOOD ANNUAL OPERATING BUDGET
(000 omitted)

	Budget Program	Ft. Hood Preliminary Programming	4th Army Guidance to Ft. Hood	Ft. Hood to 4th Army	Unfinanced	4th Army Mark-up
2000	Operating Forces	29,228	25,493	27,032	4,988	26,713
2100	Training Activities	231	732	501	—	501
2200	Central Supply	172	172	172	33	158
2400	Medical Activities	2,595	2,617	2,344	77	2,344
2500	Army-Wide Activities	82	78	82	—	25
2600	Army Reserve and R.O.T.C.	285	268	268	55	268
2800	Intelligence Activities					24
2900	Communications					33
Total Funded Cost		32,593	29,360	30,399	5,153	30,066
Changes in Inventory			−1,493	−741		−934
Changes in Undelivered Orders				−1,791		−1,791
Total Obligations			27,867	27,867		27,341
Direct Obligations			26,068	26,082		25,556
Reimbursable Obligations			1,799	1,785		1,785

sense, the programming of performance comes first because the accomplishment of assigned missions is always of paramount importance. Some of the quantitative performance factors utilized in programming and budgeting are illustrated in the following list of selected programming factors for the budget year:

Code	*Activity or Program*	*Performance Factor*	*Performance*
2010.4	Operation of Tactical Aircraft	Aircraft operating hours	23,617
2110.0	Operation and Maintenance of Schools	Number of students	1,214
2140.1	Training Devices and Publications	Items fabricated	17,800
2250.1	Line-Haul Freight	Short ton miles	609,750
2420.1	Medical Care	Average daily number of occupied beds	260

These examples illustrate some of the more important programming performed in the budgeting process and the major schedules prepared. Various supporting schedules are also prepared to detail projected reimbursable obligations, inventory balances and outstanding undelivered orders. In this instance the forecasted inventory position at the end of the budget year was estimated at $6,459,000 and undelivered orders relating to inventory were estimated to be $1,090,000 as of the same date.

Beginning-of-year positions were not known at the time this

budget was submitted, since the current year had not been completed, but the beginning inventory position was estimated at $7,200,000 and beginning undelivered order balances were estimated at $1,777,000. These two are considered together because more detailed schedules that are prepared analyze the relationship between consumption, inventory levels and undelivered orders. On the basis of these estimates, net changes in position were projected at the $741,000 inventory decrease and the $1,791,000 reduction in orders appearing in the third column of the budget summary.

Operation and Maintenance of Facilities

Of particular interest is the treatment of operation and maintenance of facilities. The costs of operating and maintaining facilities represent more than half of the Fort Hood budget for appropriation funding each year under the appropriation, "Operation and Maintenance, Army." These costs are programmed by the various support organizations at Fort Hood on the basis of performance factors similar to those illustrated for the direct or primary programs. Command and administration, for example, is based on the performance factor, population served, and Post Supply is based on line items processed. For the budget year, Fort Hood projected the costs of operating and maintaining facilities at $17,500,000, approximately 58 per cent of its total operating budget.

Inasmuch as the various support organizations at Fort Hood, for which this $17,500,000 was budgeted, exist only to service other programs, their total funded costs are assessed against the benefiting programs. For the budget year the distribution was made to Budget Program 2000, Tactical Forces, and Budget Program 2400, Medical Activities, in the ratio of 97 to 3 and the amounts thus distributed are included in the program cost estimates presented in the budget summary.

Final Program Revisions

Three weeks after Fort Hood made its official submission to the Fourth Army, it received its annual funding program from Fourth Army Headquarters and proceeded to make the necessary adjustments in its operating program and budget for the new fiscal year.

Adjustments in budget resources are made at the appropriation level but program adjustments are developed in terms of costs and of course are made at the budget program level. Controls at the budget program level are in terms of costs because costs represent the only feasible terms in which programs can be effectively managed.

Program Controls in Installation Management

By Earle M. Welch

Under the Army Command Management System Fort Hood continuously employs financial controls in its management processes throughout the year. Most of these controls are established in terms of costs because program directors at Fort Hood concentrate on controlling consumption of resources, which is in terms of costs, but do not control the procurement of resources and therefore have no need normally to concern themselves with obligations.

Cost Control

In consonance with this basic management approach, cost ceilings are developed, submitted to the Program and Budget Advisory Committee for approval or adjustment, and issued to the major program directors by the Comptroller. These cost ceilings are of course related to *all* other elements of the operating budget. For example, Table A on page 110 shows the ceilings promulgated for the Training Officer on the basis of the operating budget as adjusted to the Annual Funding Program. Within these cost ceilings, the Training Officer provided similar guidance to each of his subordinate program directors prior to the actual period of operation.

A running account of costs incurred and balances available is furnished to each program director at frequent intervals. This running account takes the form of a machine listing prepared by the Finance and Accounting Office to show in detail each supply cost incurred for the program. The actual machine listing has

TABLE A

DISTRIBUTION OF COST CEILING
(000 omitted)

1. Activity Director: G3
2. Program Director: G3
3. Budget Control Code: 2000
4. Change Number: Preliminary

	1st Qtr.	2nd Qtr.	3rd Qtr	4th Qtr.
5. Funded Cost—Total	2,512	4,795	7,139	9,447
a. Labor	5	10	14	18
b. Other Services	21	36	71	96
c. Contracts				
d. Supplies	2,486	4,749	7,054	9,333

numerous columns but the two most important are those for cost account and amount. Each program and subprogram at Fort Hood has its own cost account number to which costs are charged. Supply listings are available daily and weekly and a summary of *all* costs is provided monthly. This monthly summary is utilized by the different program directors in preparing their respective portions of the Cost and Performance Report for the installation.

The major program director and each of his subordinate program directors receive these machine listings regularly so that the actual costs incurred can be compared with the costs which had been planned. If the actual costs appear to be exceeding those that were planned, the individual program director must take steps to insure that by the end of the accounting period he will have cut back in one area or another enough to accomplish his mission without exceeding his ceiling. If he finds that he cannot accomplish his mission within his programmed ceiling, he must

MR. WELCH

Earle M. Welch, now with the Department of State, was a member of the staff of the Comptroller of the Army when he participated in this panel presentation on the Army Command Management System. Mr. Welch served 13 years in the U. S. Army, first in enlisted status and later as a captain in the Infantry. During his years of military service Captain Welch had duty in Africa, South America, Korea, and Europe. He holds a bachelors degree from the University of Rhode Island and a masters degree from The George Washington University.

go to the next higher echelon to obtain a new programmed ceiling. The latter echelon will then make adjustments among its programs.

As a practical example, the Quartermaster Supply Officer at Fort Hood may find it impossible to accomplish his job within a particular time period and yet stay within his cost ceiling, possibly because it had become necessary to hire additional workers on a temporary basis to accomplish an unforeseen task. The Quartermaster Supply Officer would then go to the Post Quartermaster with his problem. The latter, if he agreed that additional resources were necessary to accomplish the mission, would make adjustments among his other programs, perhaps the field maintenance, shop or commissary programs. After appropriate adjustment, the Quartermaster Supply Officer could proceed with the accomplishment of what had been planned.

This is management in the true sense. It is management at the operating level, where resources are actually consumed and operating economies can be effected.

Obligation Control

The procedures for controlling obligations are also based on machine listings to provide the information upon which day-to-day decisions can be made. The Comptroller is specifically charged with the administrative control of obligations. His approach is to maintain a before-the-fact control over obligations to prevent a violation of Revised Statute 3679, which makes over-obligation a statutory offense. Before-the-fact control is exercised either by precertifying the availability of funds or by issuing procurement ceilings direct to the various procurement offices at Fort Hood. Obligations for contracts are controlled in the same manner as obligations for supplies, and as long as goods are not ordered in excess of any one of the assigned procurement ceilings, positive control of all obligations is maintained.

Table B is an example of the daily procurement listing used by ordering offices in managing their procurement. This report provides detailed information on each procurement action and relates in this instance to the Transportation Corps, the technical service identified by Code 50 in the column headed "TECH SVC." The

TABLE B

DAILY-PROCUREMENT LISTING

Dept.	Fiscal Year	Object Class	Transaction Code	Tech. SVC	Block	Document	Voucher	Obligation	Accrual
11	60	08	042	50	811	2326	2326	4.91	
11	60	08	043	50	811	2328	2326		4.91
11	60	08	042	50	811	2328	2328	25.50	
11	60	08	043	50	811	2328	2328		25.50
11	60	08	042	50	811	2329	2329	1.05	
11	60	08	043	50	811	2329	2329		1.05
11	60	08	042	50	811	2331	2331	71.28	
11	60	08	043	50	811	2331	2331		71.28
11	60	08	043	50	811	9052	2322		62.00
11	60	08	043	50	811	9757	2330		14.95
								102.74	179.69

obligation column on the report shows the actual amounts of supplies ordered and the accrual column shows actual amounts received.

In addition to this daily procurement listing, there are weekly and monthly procurement listings to summarize current obligations, accrued expenditures, disbursements, undelivered orders, and unliquidated accrued expenditures. The monthly listing provides the basis for the official reconciliation between the different technical services and the Finance and Accounting Office.

The procedures underlying these reports illustrate the mechanics of obligation control. An ordering office, for example a technical service, perhaps the Transportation Corps, sends copies of its requisitions, which currently are in the form of punched cards, with a transmittal or covering block ticket to the Finance and Accounting Office. At that office, the block ticket is checked for coding and entered into the Fund Control Register, which is a blotter-type of record maintained by technical service category. The amounts of the requisitions by block ticket are then entered in the allotment ledger, which is the official record of obligations. The allotment ledger used at Fort Hood is a rather comprehensive record carrying three cumulative totals (for disbursements, accrued expenditures and obligations) and three outstanding balances (for unobligated allotments, accounts payable and contracts and orders outstanding).

Throughout the chain of command those who are concerned with the actual incurring of obligations keep close tab on progress by using informal commitment or blotter-type records. In a manner similar to that described under cost control, the inventory managers and others who incur obligations keep constantly aware of the balance of their obligational authority. A further safeguard is maintained through the procedure of assuring that, whenever a requisition for supplies or services is submitted, there is available, under the specific procurement ceiling, adequate fund resources to cover the amount of the requisition.

Allotment Status Reporting

The cost and obligation data developed under these various procedures are combined in the installation's official report on the status of funds. An actual portion of the allotment report for Fort Hood is presented in Table C. This report compares obligations incurred, $16,082,000, to allotments received, $16,631,000, and in addition gives the amount of accrued expenditures, $12,307,000. The last column shows the unobligated balance, $549,000.

In the obligations column the top figure, $16,082,000, represents total obligations incurred at Fort Hood under all appropriations. The next figure, $15,910,000, is limited to obligations for the current year applicable to the appropriation "Operation and

TABLE C

STATUS OF ALLOTMENTS AS OF 31 DECEMBER
(000 omitted)

Appropriation, Allotment, Budget Program, and Account	Allotment Received	Obligations	Accrued Expenditures	Unobligated Balance
Grand Total (All Appropriations)	16,631	16,082	12,307	549
2102020 (Operation and Maintenance, Army)	16,365	15,910	12,135	459
Budget Program 2000, Operating Forces	14,500			
P 2010 (Costs)		5,977		
P 2020 (Costs)		8,952		
Subtotal		14,929		
Change in Inventory		−1,876		
Change in Undelivered Orders		1,204		
Subtotal		−672		
Program Total (Obligations)		14,257	10,482	243
BP 2100				

Maintenance, Army." Below that amount are reported costs incurred, $14,929,000, change in inventory, $1,876,000 decrease, change in undelivered orders, $1,204,000 increase, and the total obligations, $14,257,000, for Budget Program 2000, Tactical Forces. Other budget programs do not carry these reconciling items of changes in inventory and undelivered-order balances because the reconciling items are carried in total for the entire installation under Fort Hood's largest budget program, 2000.

Comparable if not identical reporting procedures are followed monthly under the Army Command Management System at all Army installations. The obligation amounts in these installation status reports must agree with the obligation data in the allotment ledger and in the related cost and performance summary. Similarly, cost data in the status of funds statement must agree with the cost data in the cost ledger and in the cost and performance summary. Finally, the changes in resources (that is, changes in inventory and undelivered-order balances) reported in the status of funds statement must agree with the resources data in the analysis of change schedule and in the cost and performance summary.

Summary of Operating Controls

The operating controls on costs and obligations in effect during the execution phase of programming and budgeting are summarized in Table D under the headings of who, what, where, how, and when. Costs are controlled by the individual program directors on a decentralized basis through the medium of assigning cost ceilings to assist in managing operations and controlling consumption. Progress may be measured and reported on a daily, weekly

TABLE D

CONTROLS

Who	What	Where	How	When
Activities	Costs	Decentralized	Operations Consumption	Daily Weekly Monthly
Comptroller	Obligations	Centralized	Inventory Procurement Contractual Services	Daily Weekly Monthly

or monthly basis. Administrative control of obligations is vested in the Comptroller, with the responsibility for control centralized in his immediate office but the function of controlling decentralized in practice, through the device of issuing procurement ceilings for inventory procurement and contracts. In the obligation area also progress may be measured and reported on a daily, weekly or monthly basis.

Program Review and Analysis Procedures

By Edward E. Mitchell

The program review and analysis procedures stimulated by the Army Command Management System are probably its most vital feature. At Fort Hood daily consideration of problems, the development of possible solutions and the rendering of decisions have become the normal "modus operandi." It is readily apparent, therefore, that review and analysis of Fort Hood program planning and execution is a continuous process.

The sources of information for review and analysis are many and varied. A few of the principal operating program and budget documents, cost listings, procurement listings and financial management reports have been described in the three preceding companion articles but there are many others, such as training inspection, internal review, Inspector General and Army Audit Agency reports, that are used in the daily as well as in periodic review and analysis. Any effective system of management is dependent, to an appreciable degree, upon the adequacy of not only this daily, but likewise the periodic intra- and interactivity, appraisals of operating program and budget planning and execution.

Improved management, as practiced by Fort Hood, results from the:

- Integration of program appraisal with budget appraisal.
- Utilization of individual and composite program review and analysis presentations as a basis for planning and decision-making.
- Reliance on the review and analysis function as a basis for program and budget adjustments within available resources and

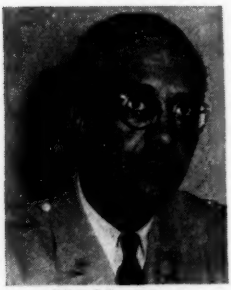
for reporting to higher headquarters on the "management by exception" principle.

- Emphasis on the Commander's Narrative Analysis section of the Cost and Performance Summary Report as the primary vehicle for providing each level of command with a concise narrative appraisal in sufficient time for use in their periodic review and analysis presentations.

Quarterly Army-Wide Cyclic Review

Although Fort Hood conducts installation-wide monthly and quarterly integrated reviews, for clarity and brevity of discussion emphasis here will be placed on the quarterly review. Fort Hood's quarterly review is an essential phase of the quarterly Army-wide review and decision-making cycle. This cycle is predicated upon a reporting schedule that is designed to permit sufficient time at all levels of command for the required reprogramming of workloads and redistribution of resources in the command's Operating Program prior to the period of execution.

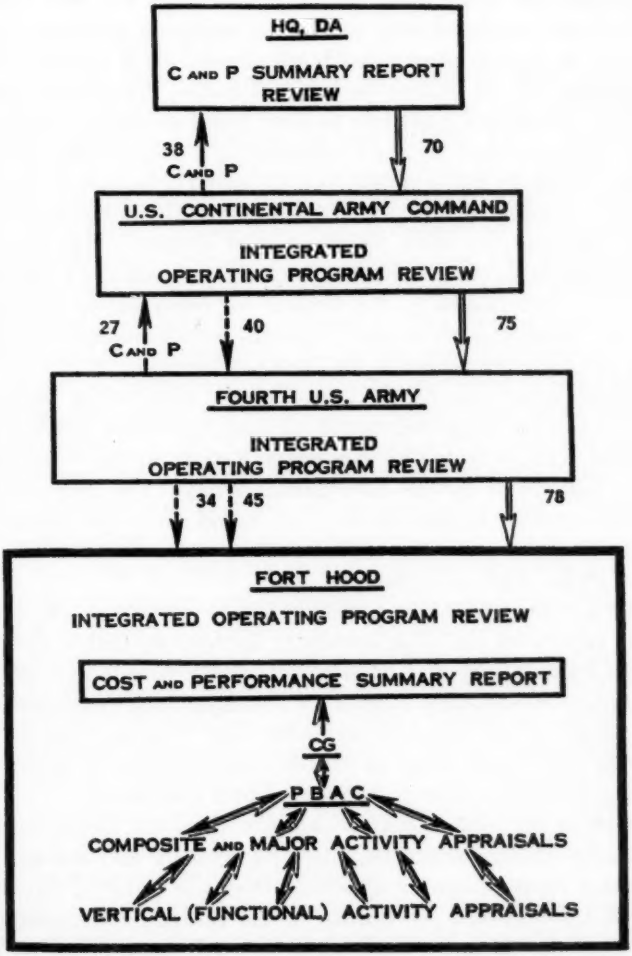
The complete Army-wide decision-making cycle is depicted schematically in the chart on page 117. The cycle begins at the bottom of the chart, the Fort Hood level, and proceeds through the Fourth Army and the Continental Army Command to Headquarters, Department of the Army, then reverses its direction to



MR. MITCHELL

Edward E. Mitchell, now on the staff of the Assistant Secretary of Defense (Comptroller), was a lieutenant colonel of the Army with duty as a Program Progress Analyst in the Program Review and Analysis Division of the Office of the Comptroller of the Army when he participated in this panel presentation on the Army Command Management System. Colonel Mitchell recently retired after twenty years of distinguished Army service which brought him many awards and decorations, including the Silver Star for Gallantry in action in Italy during World War II and the Army Commendation Medal for improvement in financial management in France during the period 1955 to 1958. Colonel Mitchell received his basic education at Fisk University, Central State College and the University of Cincinnati and has attended numerous Army schools, including the Command and General Staff College, the Adjutant General School and the Army Management School.

QUARTERLY
DECISION-MAKING (90 - DAY) CYCLE



flow back down to Fort Hood. All numbers on the chart represent calendar days after the end of each fiscal quarter.

Fort Hood conducts an integrated operating program review, based upon a composite appraisal presented by the Comptroller and program appraisals presented by the program directors. These appraisals are based upon actual data through the past reported period and projected data, within the resources available, for the current or review quarter, with adjustment to be effective at the beginning of the future or target quarter. The Program and Budget Advisory Committee at Fort Hood develops coordinated staff recommendations, the Commanding General makes the necessary decisions and a quarterly Cost and Performance Summary Report is submitted to the Fourth Army Headquarters by the 15th calendar day after the close of a quarter. This Cost and Performance Summary Report with its Commander's Narrative Analysis is employed as the vehicle for reporting to higher authority significant items and situations which require consideration, decision and action at the higher echelons.

Fourth Army, during the period of the 15th to the 26th, conducts a similar integrated operating program review and forwards its Cost and Performance Summary Report to the Continental Army Command by the 27th calendar day. The decisions and reprogramming applicable to Fort Hood that are within the authority and capabilities of Fourth Army are transmitted to Fort Hood by the 34th calendar day.

The Continental Army Command, after receipt of the Fourth Army report on the 27th, conducts its review, makes decisions within its authority and capabilities, and forwards its Cost and Performance Summary Report to Headquarters, Department of the Army, all by the 38th calendar day. The Command then informs the Fourth Army as expeditiously as possible of its decisions and the Fourth Army in turn informs Fort Hood.

Between the 38th and 70th calendar days the Department of the Army Headquarters conducts its reviews and secures any necessary reprogramming approvals from the Office of the Secretary of Defense and the Bureau of the Budget, after which the decisions are transmitted through channels back down to Fort Hood. As shown on the chart, a Headquarters decision resulting

from the quarterly cyclic review would reach Fort Hood 12 days before the target quarter. This cyclic review is resulting in improved operating program and budget execution, since the 90 day review period provides all echelons of command with adequate time for the employment of thoughtful judgment in problem solving.

Review and Analysis at Fort Hood

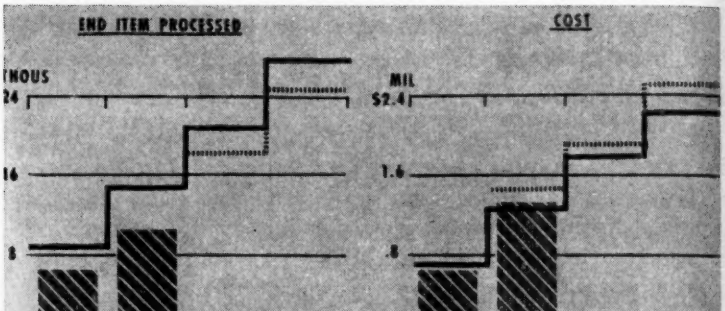
Much of the value of the review and analysis procedures at Fort Hood stem from the active but coordinated participation of all organizational elements on the installation. Each individual program director is responsible for evaluating his assigned performance areas. The general staff in turn plan, prepare, present and follow up their respective program reviews in their capacity as major program directors. The Comptroller plans, prepares, coordinates and presents a Composite Review. The Program and Budget Advisory Committee, chaired by the Deputy Post Commander, utilizes this quarterly integrated review as a *review* of *reviews* and as a basis for the developing coordinated conclusions and recommendations for achieving a balanced program within available resources. The Commanding General makes the necessary decisions and issues the appropriate implementing directives on the basis of this periodic review and the staff-developed recommendations.

Two examples of performance and cost reprogramming evolving out of this process are presented in the charts on page 120. The first deals with the effect of fluctuating attendance at service schools on cost projections. During the first quarter the number of military personnel attending service schools away from Fort Hood exceeded the number programmed. Therefore, an increase in the number programmed was planned for the second quarter. At the end of the second quarter, however, the performance (that is, the number attending school) fell below that programmed and consequently costs for the third and fourth quarters were reprogrammed as shown by the dotted lines.

The second example is a somewhat more unusual one because performance and costs were reprogrammed in opposite directions. As the left hand portion of the chart for Ordnance Field Main-

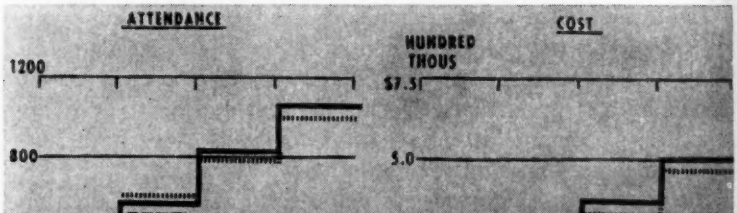
COST AND PERFORMANCE

ORDNANCE FIELD MAINTENANCE



COST AND PERFORMANCE

SERVICE SCHOOL ATTENDANCE



tenance indicates, actual performance during the first two quarters fell significantly below that programmed, resulting in the programming shown by the dotted lines for the third and fourth quarters. At the same time the dotted lines on the right hand portion of the chart shows costs to have been reprogrammed higher. There were three major factors involved in this particular situation which prompted the upward reprogramming. The first was that the repair of unserviceable major items, according to ordnance standards of serviceability for reissue, required more than the programmed man hours to accomplish. Secondly, emphasis had been placed on having the using units accomplish all field maintenance work of a minor nature; as a result only the more complex jobs, requiring a greater expenditure of man hours each, were being performed by the installation's ordnance shops. Third, resources had been directed toward the repair of increased numbers of assemblies, subassemblies and components. It was the combination of these factors which warranted the reprogramming of costs at a higher level even though performance was reprogrammed at a lower level.

Both of these examples illustrate how performance and costs are considered concurrently in the decision-making process under the Army Command Management System. The old method of budgeting and managing financially on the basis of obligations did not provide data which could be meaningfully evaluated. Obligations could not be related with actual accomplishments because it could not be determined what was in place versus what was on order or in inventory. Furthermore, it was virtually impossible in most instances to determine, when an obligation was created, just when or where the item or service would ultimately be consumed and costed. Therefore managing by obligations was largely a hit or miss proposition.

To complete the picture, the quality of accomplishments also must be measured. Quality at Fort Hood is evaluated on the basis of the formal and informal inspections, tests and field visits, which are programmed and conducted as a basic part of Army operations.

Cost-Based Budgeting in the Future

Under the Army's system of cost-based budgeting the area of resources (money, inventory and undelivered orders) is isolated,

disclosed separately in records and reports, and managed, as it should be, through the medium of obligations. This permits the actual accomplishments or work in place to be reflected in terms of costs and these costs to be measured in terms of performance.

Ultimately the Army's procedures will lead to the establishment of the meaningful work factors and cost factors which are needed to develop and evaluate operating budgets with a more acceptable degree of accuracy. It will do away also with the practice of taking a year as a base and through the increase and decrease method arriving at the requirements to be included or approved as the budget. This practice, although in wide use throughout Government, is neither desirable nor even acceptable since it perpetuates inequities and imbalances and never arrives at an equitable distribution of resources.

Willard Fazar

Navy's PERT System

Navy success with POLARIS has been matched by success in developing advanced systems of management. PERT, an advanced system for program time and cost management, was developed by applying to decision-making processes the same careful orderly approach engineers practice in developing advanced military hardware systems.

The accelerated pace of science and technology in today's space age challenges managers to provide the leadership for which they have been traditionally acclaimed. Managers in government and industry alike are concerned with the improvement of management planning, control and decision-making systems. They also have a basic objective in common: to make the best possible use of alway-limited resources. Government has limited national resources to serve the national objectives and industry has limited corporate resources to serve its corporate objectives.

In recent years the Navy's Special Projects Office, world-famed for its POLARIS missile, has mastered this common problem of government and industry, through management and decision-making systems that optimize returns from limited dollar and physical resources. This unique Office was established to integrate the efforts of thousands of participants throughout the United States, in government laboratories, non-profit organizations and industrial contractors' plants. Its spectacular success in developing the POLARIS Fleet Ballistic Missile Weapon System is as much the product of modern systematic management as of modern science and technology.

Early Management Approaches

Numerous management tools were developed or adapted by the Special Projects Office in its search for the most effective decision-making system. One of these was the "Management Center"—

a room that has served notably a great variety of purposes. It is a place in which anyone concerned can see the plans for carrying out the program and current progress status relative to plan. Here weekly top management receives a presentation of progress and problems from the key staff officials, those having the authority and responsibility for carrying out various segments of the program.

Progress status charts are emphasized in these management center presentations. They have become the standard medium for reporting on major components of the program, through "thermometer bars" that express the current status of progress in top-management *subjective* language. There are four basic status categories for this purpose, namely:

In Good Shape: "Admiral, everything is going as planned—there is nothing you nor I need to take special action on, no problems to overcome."

Minor Weakness: "Admiral, I have a problem here. This is what it is; this is what I am going to do about it. It is within my capacity, resources and jurisdiction to handle."

Major Weakness: "I have a problem that is beyond my capacity, resources and authority to resolve. Admiral, I need your help."

Critical: "Admiral, you need help."

Highlights are added to state briefly why any bars are below the "Good Shape" level, as well as to point out significant recent or

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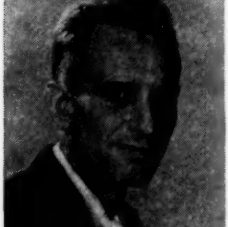

MR. FAZAR

Willard Fazar has been engaged for some five years by the Navy's Special Projects Office to develop management and program evaluation systems for the POLARIS Fleet Ballistic Missile Weapon System. Known as the "Father of PERT," Mr. Fazar initiated and directed the operations research effort that resulted in the PERT technique. He holds a masters degree from Cornell University and has had extensive program analysis experience in industry and government. He has written often, and made numerous presentations to executive-level groups, on advanced management techniques.

near-future developments worth calling to top management attention.

Another management tool that proved invaluable amounts to nothing more than a simple standard format, called the "Program Management Plan," which gives brief answers to basic questions: "What? Who? How? When? Why? This single-page format shows significant milestones and schedules for the current plan at all levels of "need-to-know." It identifies and communicates responsibility and the nature of necessary overlapping responsibilities:

> Direct responsibility, assigned to one man or office to accomplish a task.
>
> Supporting responsibility, required of other men and offices.
>
> Monitoring responsibility, required of still other persons and offices because of their need to know when a given task is performed, where its accomplishment will support a task for which they have direct responsibility in a related plan.

Simple traffic-light signals were evolved to denote progress against "action milestones" in the Program Management Plan—green circles, indicating that planned bench marks or milestones were met on schedule; blue stars, ahead of schedule; red triangles, highlighting slippage; and orange squares, signaling that some future bench mark needs attention or action, because it is in jeopardy and may fail to meet the assigned schedule date. This Program Management Planning System added discipline to the thinking, planning, communication and coordination of all POLARIS Program participants.

A third major system known as line-of-balance or production analysis was adopted to assist in managing repetitive effort, such as production of a number of units of hardware of the same specification. The system shows, for any given date, what the balance should be of critical effort required for delivering or shipping items of hardware as planned. Bar charts are used to report status, the bars representing the current inventory of major elements of effort. Comparison of the height of the bars with the line-of-balance indicates *where* shortages and overages of effort exist and thus serves as a basis for management action.

Evolution of PERT

Despite the many obvious merits of these procedures, and they still are very important elements of the management pattern in use today, it shortly became apparent that considerable improvement was needed. Three additional kinds of data were desired:

Data *to assess the validity and reasonableness of plans and schedules* for carrying out a program and meeting key objectives.

Data *to measure progress in research and development*—there was none available other than the unsatisfactory "We are 30 per cent complete because 30 per cent of the money has been expended."

Data *to predict the outlook for meeting the objectives,* through the currently approved plan, without further executive action.

An operations research team was established early in 1958 to tackle this problem as an applied research task under the code-name PERT. Originally PERT meant "Program Evaluation Research Task" but once the system was developed PERT's meaning was adjusted to "Program Evaluation and Review Technique."

The operations research team recognized a number of significant facts at the outset. One was that the field of research and development involves wide ranges of uncertainty about the possible outcome. The approach here was to seek a method for giving numerical expression to the chances for success, not only for completing the final task in meeting the end objective, but for completing scheduled interim objectives in appropriate phase with the target date set for the end objective. Another significant fact recognized was the importance of integration of the factors that influence success: time, resource applications (dollar and physical) and technical performance. The operations research team thought it might be possible to measure one of these to represent all three and this is what the basic PERT system eventually did.

Basic PERT System

PERT uses time as the common denominator to represent all three categories of factors, because a significant change in re-

sources or technology is always accompanied by significant changes in time. Moreover time was considered to be the "scarcest resource" for achieving the POLARIS goal.

The basic PERT system involves four steps:

Step 1: Select specific identifiable events or milestones that must occur in the development program in order for the project to be concluded successfully. These events must be meaningful in the development program, they must be definite and recognizable, and each must be a point in time.

Step 2: Link these planned events graphically to portray the interdependencies among them. The planned events comprise a set of accomplishments, each of which will exist at a given point in time as the culmination of one or more activities. The actual work activities carried on in the development program can thus be visualized as filling the gaps between events and the linked events form a network which can best be described as a "blueprint of the plan."

Step 3: Estimate the times necessary to move from event to event and provide appropriate measures of the uncertainties involved. The tentative network established in the preceding step can then be scaled to reflect time between events.

Step 4: Determine relative criticality of events by systematic analysis of the required time spans of the different series or combinations of sequentially-related events.

Figure 1 is a typical PERT flow diagram or network showing the ordered sequence of identified events, or milestones, that must be accomplished from "time-now" to reach the end objective. Events are depicted in the network by circles and the various interrelations between events are depicted by connecting arrows, with the length of the arrows varied to reflect elapsed-time estimates for the activities or work that must take place between events. A network is drawn by working backward from the end objective. The question is asked and answered, "What significant events, or bench marks, must be accomplished just before you meet this end objective?" This question is repeated for each event preceding the end objective, back to "time-now" if work is in

progress, or back to the first event of the plan if work has not begun.

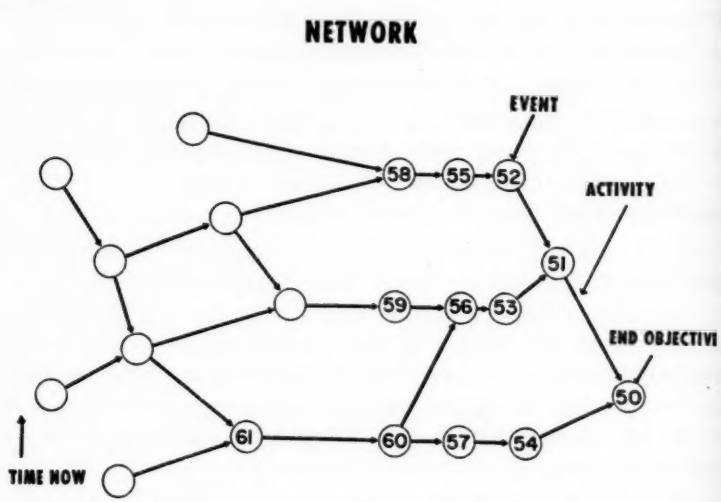

Fig. 1

The arrows in a network show sequence as well as interrelationship between events and the events can be either tangible or intellectual bench marks, such as required approvals and decision points. There are two categories of sequence and interrelationship. One is technologically necessary; there is no choice. If event "56," for instance, is "Assemble cup and saucer," it must be preceded by two events, one representing the availability of a cup and the other the availability of a saucer. Elsewhere in the network will be places where planners, managers or technicians had a choice of alternatives. A current PERT network always shows the choice made in the currently approved plan. If the choice is changed next week, the new information must be fed into the system and its impact on the outlook for meeting the end objective reflected, an operation that can be accomplished very quickly by computer print-out.

The arrows thus represent the time and resource-consuming activities or work-in-process that must occur between completions

of events. In order to reflect time uncertainty, estimates of activity time are gathered in terms of units of time, not calendar dates. Three time estimates are obtained from the experts, the people in charge of doing the work, for each activity or arrow: *most likely time, optimistic time, and pessimistic time,* each in terms of weeks of time. All three estimates must represent time for the same technical performance specifications and rate of resource application.

The procedure followed in collecting time estimates is rather interesting. After orientation of the expert who is to furnish time estimates for activities he supervises, three time estimates are obtained for each successive activity. The PERT analyst might be told by the expert that if he did the work repetitively 100 times, in roughly 60 out of the 100 times it would take 12 weeks—the most likely time. The next question would be: "Once or twice out of 100 times, Mr. Expert, how little time do you think it might take to do this job, without magic or acts of God?" Once or twice, or with good luck, he might say, 9 weeks—the optimistic time. Then the question, "Suppose you have bad luck and encounter all the problems you believe you could have to face, but no fires, strikes or acts of God. How long might this activity take once or twice out of 100 times?" His answer might be 20 weeks—the pessimistic time.

These three time estimates are used to develop a time distribution, by electronic computer, to show the variation in time that might be required to complete the activity an infinite number of times. The time distribution curve is based on a mathematical inference formula devised to produce a reasonable probability projection from the three time estimates. The curve reflects the probability or chance of performing this task at any point in time. The most likely time would be the peak of the curve; the optimistic and pessimistic times would be the extremes of the range. Another very important item of time information derived from this formula is average or expected time, the time that divides the area under the distribution curve into two equal halves. This is the time in which there is a 50-50 chance of completing the work.

Every variation of time distribution may be found in PERT systems. There are normal distributions with wide ranges and normal distributions with narrow ranges. The narrow range may typify a significant administrative activity. There are right-skewed and left-skewed distributions. The significant thing is, the system handles every possible variation. It shows, no matter how many events there may be, where danger exists and where there is time to spare. Thus it identifies the *relative significance* of the things that must be accomplished pursuant to the currently approved plan.

PERT in Operation

How PERT operates can be illustrated by reference to the small segment of a PERT network shown in Figure 2. If the area of concern is moving from event 8 to end-event 6, PERT shows three concurrent paths of activity to be involved. It shows that the expected time for the top path is 2 plus 4 or 6 weeks; for the middle path, 4 plus 5 or 9 weeks; and for the bottom path, 5 plus 2 or 7 weeks. It then concludes that if any trouble is likely to occur in getting this job done by week 65, and a calendar date can be put on that, the most likely spot for trouble is the longest path —the *critical path.* There is slack, time to spare, in the top and bottom paths.

The electronic computer goes through a network both forward and backwards. It goes through forward accumulating the expected time; it goes through backwards by anchoring the end objective and reading out the latest time by which each event can be accomplished without extending the critical path. Thus event 44 in the top path could be accomplished as much as three weeks later without taking more than the nine weeks required for the middle path. Similarly, event 33 in the bottom path could be accomplished two weeks later. If there is slack or time to spare, there may be dollars or resources to spare. It might be found, for instance, that a double shift is working to meet the scheduled date for event 44. Reducing the effort to a single-shift basis might extend the time required by two weeks but would involve no detriment to the end objective. A reduction here would represent a saving in dollars and resources that might be used to buy

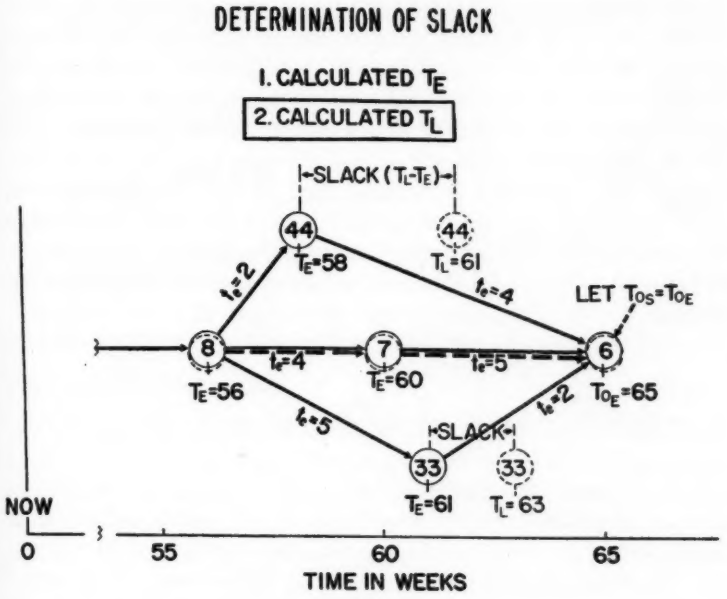

Fig. 2

te = Mean time to complete activity
TE = Expected time to complete event
TL = Latest time by which event must be completed to complete end event by a given time (65th week, here)
TO_E = Expected time to complete end objective
TO_S = Scheduled time to complete end objective

time in the critical path. If these resources cannot be used to advantage to buy time in the critical path, they certainly can be used to better advantage elsewhere.

PERT enables management to see quickly its chances for achieving the end objective by the scheduled date, or by any other date. Figure 3 shows a case where the expectation is 92 weeks to complete the end objective and the scheduled date is 82 weeks. This means there is a 50-50 chance for completion in 92 weeks, but only a 1-in-20 chance for completion in 82 weeks. The manager or technical administrator has no choice here but to make a decision. He might say "PERT's no good—I don't believe that I have only

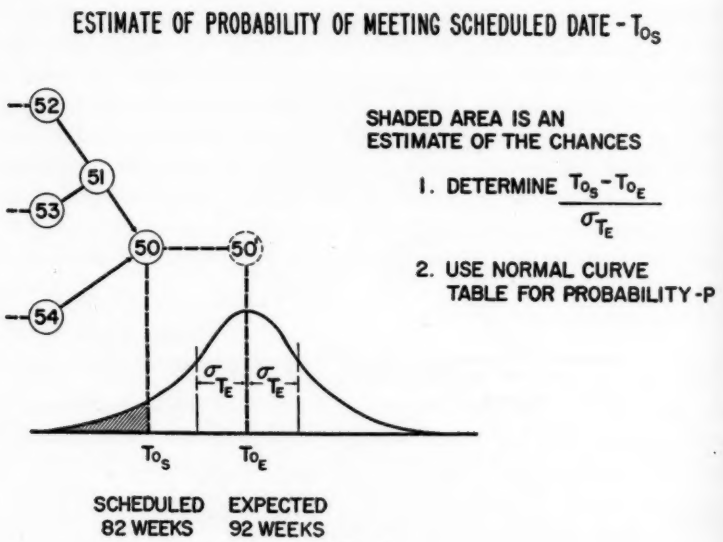

Fig. 3

σ = Standard deviation
Other symbols same as in *figure 2*

a 1-in-20 chance of getting this task performed by the 82nd week. I'll take no action." Or he may make another type of passive decision and say, "I'm not worried; ten weeks won't make much difference. I'll slip the schedule to 92 weeks." This of course would not be allowed to happen in the priority POLARIS program. A POLARIS manager would say: "I've got to increase my chance of getting this job done by the scheduled date; how do I do it?" He then would examine the network for the critical path, to see where time could be saved in that critical path, perhaps by transferring resources from slack areas. If this were impossible, either the plan would have to be adjusted or the required technical performance would have to be lowered.

In POLARIS, a small team works with each contractor to lay out a network for achieving the objective of the particular contract and to attach time estimates to the network activities. These original input data are examined for reasonableness by the technical staff of the Navy. If accepted as reasonable, they are com-

puter-processed to provide print-outs that show what the outlook is, as of the curent time, for meeting the end objective. These output sheets are analyzed; the criticalness is pointed up and suggestions are sought for overcoming problems that are revealed. Top management and the technical direction staff immediately have a choice; they may decide on a specific action, change the plan accordingly, and go back through the process. Often, however, there may be several alternative courses of actions that appear to have merit. These can be and usually are pretested on the computer. Each alternative is simulated on the computer to determine what its impact on the outlook would be. It then is possible to choose the alternative having the greatest promise.

Print-Out Improvements

The computer print-out sheets used in PERT have evolved and improved over time. Early computer print-outs listed the sequence of events, the expected time, the latest times, the slack, a sample of scheduled dates, the probability of meeting those dates, and number-of-weeks-from-time-now equivalents of scheduled dates. Later, words were added to the computer print-out to identify the events, so that users would not have to refer to detailed network descriptions to tell what each code number meant. Next, the computer was programmed to translate weeks of time into calendar dates, because people are accustomed to thinking in terms of calendar dates. More recently an automatic print-out was developed to indicate the latest date by which every event in the network must be accomplished if the target date is to be met. To do this, the computer anchors on the defined target date, then works backwards to read out these latest dates. This technique often produces negative slack, identifying where and how much time will have to be made up if the target date of the end objective is to be met.

The Bureau of the Budget has approved a very simple but effective form for maintaining PERT inputs. Every two weeks new inputs are reported and it is no problem for the computer to process completion dates for events, as well as changes in time estimates whenever changes must be made or acknowledged. Additions or deletions of events in the network are also covered.

The impact on outlook for meeting the end objective is available from the computer print-out.

Displays of PERT print-out results are always tailored to the different levels of management. It would never be appropriate, for example, to bring a network of a thousand events to top-management conferences with the thought of having the analysis done there. The necessary analysis should be completed before any presentation is made to top management, so that emphasis in the presentation can be placed on major end objectives. Top management is interested fundamentally in the outlook for getting the jobs done, not in the technical details involved.

An interesting development came along when some of the larger contractors decided to process PERT through their own computers, in order to keep up with the customer or get information on PERT outlooks before the customer. A system was developed whereby computers communicate with computers. When contractors run their PERT data on their own computers, they furnish the outputs and their analytical statements to the Navy. This exchange allows the Navy to make simulation runs of possible decisions to overcome problems and to integrate the input of one contractor with that of another contractor to achieve broader end objectives. Contractor analyses identify problems, possible "get-well" dates, action being taken by the company involved, and action required by the customer.

Future Advancements

Operations research in new PERT developments is being pursued aggressively. About one year ago a project was established for the design of a system for monitoring, estimating and predicting reliability. This reliability research task, code-named PRISM (Program Reliability Information System for Management) has produced to date two interesting systems: one for monitoring customer and contractor compliance with reliability requirements, and another for estimating system, subsystem and component reliability.

A more recent project is directed towards evolving a system for applying the PERT time concept to the measurement of costs and the cost-time outlook for achieving weapon system objectives.

This particular project was stimulated by wide-spread expression of need for such a system and the effort being made by many organizations to relate dollar costs and physical resources to tasks and activities in PERT networks. Successful development of a PERT cost system would make a major contribution to the "Expanding Horizons of Planning" in both government and industry.

Continuous operations research in these areas should produce ultimately, perhaps in the not too far distant future, an integrated system that will measure and interrelate the influence of time, cost and technical performance on the successful achievement of advanced weapon and space system objectives. An integrated system for *multiple PERTing* would permit the simulation and testing of the significance of different mixes of these factors on the achievement of objectives and provide sounder bases for making choices to optimize plans and improve the return from always limited resources.

Summary

PERT is a management tool that sizes up the reasonableness of plans and schedules by measuring progress and the outlook for getting jobs done by deadline times. The basic PERT system uses time as a common denominator to reflect three categories of factors that influence success: time, resource applications, and technical performance. The outcome of many technical decisions made in the POLARIS project on the basis of PERT findings fully confirms the usefulness of time as a common denominator. In terms of essential features PERT:

- Blueprints the order of "progress bench marks" in a given program as they must occur under current planning to meet objectives.
- Measures best knowledge about the uncertainties involved in achieving these bench marks.
- Integrates the impact on outlook for completing objectives.
- Pinpoints danger signals and slack areas as bases for taking executive action.

- Tailors electronic computer and visual outputs to the needs of different levels of management and technical administration responsibilities.
- Permits computer simulation of the time-consequence of optional courses of action.

INCREASING COMPLICATIONS OF MANAGEMENT IN GOVERNMENT

The art of management in Government is becoming more complicated as a result of a great many factors—among them the worldwide impact of Government programs, the lengthening time span in our long-range programs between the making of decisions and their ultimate fulfillment, the need for releasing and utilizing the creativity of professional personnel, and the need to keep pace with rapidly changing social and technological goals.

. . . Civil Service Chairman Macy in announcing arrangements for a November conference at Princeton University to explore strengthening College-Federal Relationships

Herbert Arkin

Sampling and the Auditor

Dr. Arkin highlights for auditors in industry and government the basic concepts of statistical sampling in terms of what, how, and how much to sample and the significance of what the sample discloses.

Early auditors performed their examinations on a 100 per cent basis. However, as business grew, this approach became obviously impossible due to the mass of entries confronting the auditor. The auditor then resorted to the technique which has become known as the "test." This technique involved examining part of the entries or records with the view of drawing a conclusion about all of them. Thus the audit test is a sampling operation. The sampling methods to be used became entirely a matter of decision by the individual auditor.

Standards of Test Lacking

The independent commercial auditor, no matter what methods of sampling be used, could fall back on the fact that he certified that his audit was conducted in accordance with "generally accepted auditing standards." However, it is apparent that, insofar as sampling methods are concerned, there are no standards. The method and size of the test has been left entirely to the judgment and whim of the individual auditor.

For instance, *Generally Accepted Auditing Standards*[1] published by the American Institute of Certified Public Accountants merely states that "the appropriate degree of testing will be that which may reasonably be relied upon to bring to light errors in about the same proportion as would exist in the whole of the record being tested" and that "the testing technique thus rests for its justification upon its reasonableness, which in turn involves

[1] *Generally Accepted Auditing Standards, Their Significance and Scope*, American Institute of Certified Public Accountants, New York 1954, pp. 37 and 35.

a variety of circumstances. . . ." However, no inkling is given as to how this worthwhile objective is to be obtained. Nor does examination of current practices disclose any "standard" techniques universally used in the test method.

Yet the techniques of statistical sampling, an objective and scientific method, have been available and widely used in virtually every other field where sampling is required. The application of statistical sampling methods in accounting and auditing situations is relatively new, perhaps due to the reluctance of auditors and accountants to apply these methods due to the misconception that they must become statisticians in order to do so. Nothing could be further from the truth. However, it will be necessary for the auditor to learn these techniques and the principles underlying them.

Re-Education Required

This education of the auditor in a new field will require effort on his part but such a requirement for re-education is not new. At their inception, the auditor had to educate himself in punched card techniques which were then new to him and more recently education in the area of electronic data processing has become necessary. It is the fate of those working in any professional field to continuously re-educate themselves as new and better techniques become available. It is the auditor's responsibility to

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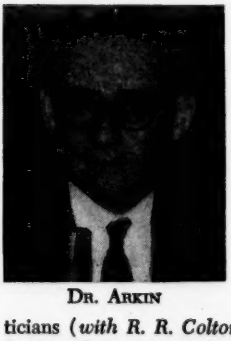


DR. ARKIN

Herbert Arkin, Professor of Business Statistics at the Baruch School of Business Administration, City University of New York, is statistical consultant to Price Waterhouse & Co., Philip Morris, Inc., Reader's Digest and other business organizations. Dr. Arkin also directs the Statistical Training Project between City University of New York and the Army Audit Agency and frequently addresses FGAA meetings, most recently the Philadelphia Chapter's Seminar on Statistical Sampling as a Tool of Financial Management. He is author of numerous articles and books including Statistical Methods *(with R. R. Colton) and* Tables for Statisticians *(with R. R. Colton). Among his professional affiliations are the American Statistical Association (of which he is a member of the Committee on Statistical Methods for Accounting), the American Society for Quality Control and the Institute for Mathematical Statistics.*

undertake such a re-education or he will find himself seriously outmoded with considerable jeopardy to his professional standing.

In recent years there has been an astoundingly large growth in interest in the use of statistical sampling in the audit tests. This has been reflected in the literature of the field of auditing where numerous articles and books on statistical sampling in auditing have appeared. Various accounting firms and governmental agencies have developed training programs for their personnel. Among these groups the U.S. Army Audit Agency has taken a leading position with a training course which provided such education for hundreds of their auditors. The various accounting societies have all formed committees to investigate this area and some, particularly the Federal Government Accountants Association, have sponsored courses for their members.

Fear has been expressed by some auditors that the use of statistical methods will make the audit test a mechanical operation with no room for the exercise of the auditor's judgment. Actually in any test the auditor exercises his judgment primarily in determination of test objectives (what to sample) and the audit interpretation of the findings. Statistical techniques do not intrude on either of these situations but merely provide assurance that the data compiled from a test, and thus comprising the facts to which the audit judgment is applied, are actually the facts, with a known margin of error due to the fact that a sample was taken. In no way is the exercise of audit judgment limited.

The auditor requires a sampling procedure which is unbiased, objective and defensible. The "judgment" sample usually used by the auditor becomes indefensible when the audit test fails and under any circumstance rests for its justification upon the judgment of the individual auditor. Yet ability at judgment varies not only from auditor to auditor but even for the same auditor at various times. The statistical sample has its justification in the mathematical principles on which it rests and is defensible at all times, even in courts of law.

Sampling Approach

The form of the statistical sampling approach to be used in a

given test will be dependent upon the objectives of that test. There are three approaches of value in auditing:

1. Estimation sampling
2. Acceptance sampling
3. Discovery (exploratory) sampling

Estimation sampling answers the question as to *how many* or *how much*. How many errors, evasions of regulations, etc., exist in a set of documents? This form of estimation sampling is termed *attributes* sampling. On the other hand, the interest may be in the estimation of the dollar value of these errors or of an inventory. This form of estimation sampling is referred to as *variables* sampling.

Acceptance sampling is a technique by means of which a field is "accepted" or "rejected" as being good or bad. This is accomplished by selecting a sample of a given size from a field of documents or entries of a specified size and examining the sample for errors. If the sample contains more than a specified number of errors, the field is rejected; if not it is accepted.

While acceptance sampling was generally recommended as the most useful approach in early auditing literature on this subject, and to some extent it still is, present thinking indicates that, generally speaking, the auditor will find estimation sampling more useful.

The objective of discovery (or exploratory) sampling is different. Here the purpose is to give reasonable assurance to the auditor that if some type of event (errors, evasions, fraud, etc.) exists in the field with some minimum frequency he will include at least one example of such an event in his sample. The method indicates how large a sample it is necessary to take to achieve this end.

Obviously then some decision must be reached as to the approach to be used and this in turn stems from the test objectives. There is a need for specific statements of test objectives here which has proved quite beneficial apart from the needs of statistical sampling by requiring a re-examination of test purposes. Vague objectives cannot be used to develop statistical sampling plans.

What and How to Sample

The sampler in any field is confronted by four questions:

1. What to sample?
2. How to sample?
3. How much to sample?
4. What do the sample results mean?

While the determination of the test objective by the auditor generally defines what is to be sampled, there are considerations relating to the field and sampling unit as well.

It is to be noted at this point that, contrary to some beliefs, the use of statistical sampling techniques do not require the sampling of all items when the auditor's interest is in certain items only. If the auditor decides he is interested in only those vouchers in excess of $100, there is nothing in the statistical method requiring him to include other vouchers in his test. However, it must be remembered that the results of such a test may be projected to state the condition of these items only and no conclusion can be drawn about types not given an opportunity for inclusion in the sample. It is to be emphasized that sample results can be projected to represent only the field from which they were drawn and if the auditor chooses to rule out part of the original field his results are projectable only to that portion sampled.

The advantages of statistical sampling including the ability to make an advance determination of the required sample and the appraisal of sample reliability arise from the application of the mathematical theory of probability. However, this is possible only if the sample is a true statistical sample. Such a sample is called a "probability" or random sample.

A probability or random sample must be obtained in a certain way so that there is an equal probability of inclusion of any sampling unit in the field or in some cases a subdivision of the field. This does not mean that a random sample can be obtained by haphazard choice. A probability sample can be obtained by two methods:

1. Random number sampling
2. Systematic sampling

Random number sampling makes use of random number tables such as those published by the Interstate Commerce Commission's Bureau of Transportation, Economics and Statistics (Table of 105,000 Random Decimal Digits) or that published by the Rand Corporation (A Million Random Digits). The choice of the sampling units to be included in the sample is determined by the numbers listed in such tables.

In *systematic sampling,* every nth sampling unit is included *beginning with a random* start. While many consider this method to be simpler than random number sampling, it is less preferred because of the danger of a bias when the sampling units are arranged in some form of pattern.

How Much to Sample

In order to determine the appropriate sample size for an estimation sample, either attributes or variables (how many or how much), the auditor must arrive at certain decisions. He must decide how closely it is necessary to establish the projection. Is it necessary to know the actual rate of errors to within $\pm 0.1\%$, $\pm 1\%$ or 2% etc.? This sampling tolerance is called the sample *reliability* or *precision.*

In addition, since there is a risk attached to any sampling operation, no matter how large the sample, he must establish the risk he is willing to run, remembering that the smaller the risk, the larger the resulting sample. This risk is generally expressed as the probability that the sample projection will actually be no further from the value obtainable by a 100 per cent sample than the previously determined sample precision. This is called the *confidence level.* Confidence levels are then the expression of the probability that the auditor will be correct, when he projects the sample result to estimate the value obtainable from a complete examination, to within a certain amount of that value. Confidence levels of 90, 95 and 99 per cent are quite widely used. The auditor will have to select the proper confidence level in terms of the objective he has in mind.

The sample size required to achieve the desired sample precision and confidence level can now be determined from appropriate tables. If the sampling is for attributes (rate of occurrence)

and the auditor wishes to minimize his sample size, it will be necessary to estimate the maximum probable rate of occurrence in the field. While sampling sizes can be fixed without such a determination, they will be unnecessarily large. A section of such a table is reproduced as Table 1.

TABLE 1

SAMPLE SIZES FOR SAMPLING ATTRIBUTES
FOR RANDOM SAMPLES ONLY

Expected Rate of Occurrence Not Over 5%
Confidence Level 95%

Number of Items in Field	*Sample Size for Reliability of:* ± 1%	± 2%	± 3%	± 4%	± 5%
200			101	73	53
300			121	83	59
400			135	89	62
500		238	144	93	64
1,000		313	169	102	68
1,500		350	179	106	70
2,000	954	371	184	108	70
2,500	1055	386	187	109	71
3,000	1134	396	190	110	71
3,500	1199	403	192	110	71
4,000	1253	409	193	111	72
4,500	1298	414	194	111	72
5,000	1336	418	195	111	72
6,000	1399	424	196	112	72
7,000	1447	428	197	112	72
8,000	1485	431	198	112	72
9,000	1517	434	198	113	72
10,000	1543	436	199	113	72
15,000	1626	443	200	113	73
20,000	1672	446	201	113	73
25,000	1700	448	201	113	73
50,000	1760	452	202	114	73
100,000	1791	454	202	114	73

If the auditor should overestimate or underestimate this maximum rate of occurrence used to determine the sample size, he is protected by the later appraisal of the sample result which is necessary under all conditions. However, he may find that he has achieved a better or worse sample precision than he had desired.

Similar methods may be used to establish the sample size for variables. In this case, the sample size determination is affected by the variability of the values in the field. A preliminary sample

will provide that information. The details of the method are beyond the scope of this limited discussion.

What the Sample Results Mean

After the sample is at hand, it is possible to reappraise the result for a final determination of the sample reliability actually achieved. This is done by reference to tables such as that shown in Table 2.

For instance, if a sample of 300 is drawn from a field of 10,000 for an attributes estimation sample and the rate of occurrence of 6%, the table indicates that 95 chances in 100 (or 95% confidence level) the sample came from a field containing not less than 3.7% nor more than 9.2%. Tables for variables estimation samples provide a similar ability to reappraise such sample data on the basis of the field sample.

Discovery sample tables such as that reproduced in Table 3 provide an ability to determine the sample size required to obtain any degree of assurance desired of including an instance of the type sought, if it occurs in the field at not less than some specified rate. A very complete set of such tables has been published by the Auditor General of the U. S. Air Force.

For instance, it can be seen from Table 3 that a sample of 200 from a field of 3,000 will provide a 87.5% assurance that *at least* one such event will be found in the sample if the rate of occurrence in the field is 1%.

In this brief discussion it is not possible to examine the more sophisticated sampling techniques. While the auditor can operate without these techniques, knowledge of these methods can result in a very considerable reduction in the required sample size with the attendant saving in audit costs.

In closing it might be said that while the use of statistical sampling may require a greater effort on the part of the auditor it is to be remembered that an unbiased, objective projection with a known sample reliability will result. There may be easier ways to sample but it must be emphasized that *it is better not to sample at all than to sample incorrectly or inadequately.*

TABLE 2

TABLE 2

SAMPLE RELIABILITY FOR RELATIVE FREQUENCIES
FOR RANDOM SAMPLES ONLY

Rate of Occurrence in Sample 6%
Confidence Level 95%

And Field Size is:	*For Sample Size of:* 50		100		200		300		500		1000		2000	
	Lower Limit	*Upper Limit*	*Lower Limit*	*Upper Limit*	*Lower Limit*	*Upper Limit*	*Lower Limit*	*Upper Limit*	*Lower Limit*	*Upper Limit*	*Lower Limit*	*Upper Limit*	*Lower Limit*	*Upper Limit*
200	1.9%	15.2%	3.3%	10.7%										
300	1.7	15.7	2.9	11.4										
400	1.6	15.9	2.7	11.7	4.0%	9.0%								
500	1.5	16.0	2.6	11.9	3.8	9.3								
1,000	1.4	16.3	2.4	12.3	3.5	9.8	4.0%	8.7%	4.7%	7.7%				
1,500	1.3	16.3	2.4	12.4	3.4	9.9	3.9	8.9	4.5	8.0				
2,000	1.3	16.4	2.3	12.4	3.3	10.0	3.8	9.0	4.4	8.1	5.0%	7.2%		
2,500	1.3	16.5	2.3	12.5	3.3	10.0	3.8	9.1	4.3	8.2	4.9	7.3		
3,000	1.3	16.5	2.3	12.5	3.3	10.1	3.8	9.1	4.3	8.2	4.9	7.3		
3,500	1.3	16.5	2.3	12.5	3.3	10.1	3.7	9.1	4.3	8.3	4.8	7.4		
4,000	1.3	16.5	2.3	12.5	3.3	10.1	3.7	9.2	4.2	8.3	4.8	7.4	5.3%	6.8%
4,500	1.3	16.5	2.3	12.5	3.2	10.1	3.7	9.2	4.2	8.3	4.8	7.5	5.3	6.8
5,000	1.3	16.5	2.3	12.5	3.2	10.1	3.7	9.2	4.2	8.3	4.8	7.5	5.2	6.9
6,000	1.3	16.5	2.3	12.5	3.2	10.1	3.7	9.2	4.2	8.3	4.8	7.5	5.2	6.9
7,000	1.3	16.5	2.3	12.6	3.2	10.2	3.7	9.2	4.2	8.3	4.7	7.5	5.2	7.0
8,000	1.3	16.5	2.3	12.6	3.2	10.2	3.7	9.2	4.2	8.4	4.7	7.5	5.1	7.0
9,000	1.3	16.5	2.3	12.6	3.2	10.2	3.7	9.2	4.2	8.4	4.7	7.6	5.1	7.0
10,000	1.3	16.5	2.3	12.6	3.2	10.2	3.7	9.2	4.2	8.4	4.7	7.6	5.1	7.0
15,000	1.3	16.6	2.3	12.6	3.2	10.2	3.7	9.3	4.1	8.4	4.7	7.6	5.1	7.0
20,000	1.3	16.6	2.3	12.6	3.2	10.2	3.7	9.3	4.1	8.4	4.6	7.6	5.1	7.1
25,000	1.3	16.6	2.3	12.6	3.2	10.2	3.6	9.3	4.1	8.4	4.6	7.6	5.1	7.1
50,000	1.3	16.6	2.2	12.6	3.2	10.2	3.6	9.3	4.1	8.4	4.6	7.6	5.0	7.1
100,000	1.3	16.6	2.2	12.6	3.2	10.2	3.6	9.3	4.1	8.4	4.6	7.6	5.0	7.1

TABLE 3

PROBABILITIES OF INCLUDING AT LEAST ONE OCCURRENCE IN A SAMPLE

FOR RANDOM SAMPLES ONLY

When Sample Size is:	*When Occurrence Rate is:* .05%	.1%	.5%	1%	2%	5%	10%
	Probability of finding at least one occurrence is:						
			Field Size is 3000				
10	0.3%	1.0%	4.9%	9.6%	18.3%	40.2%	65.2%
100	5.0	9.7	39.9	64.0	87.2	99.5	100.0
200	9.8	18.7	64.6	87.5	98.5	100.0	100.0
400	19.3	34.9	88.4	98.7	100.0	100.0	100.0
600	28.4	48.8	96.5	99.9	100.0	100.0	100.0
800	37.2	60.6	99.4	100.0	100.0	100.0	100.0
1000	45.6	70.4	99.8	100.0	100.0	100.0	100.0
			Field Size is 10,000				
100	4.9%	9.6%	39.5%	63.6%	86.9%		
200	9.6	18.3	63.6	86.9	98.3		
500	22.6	40.1	99.3	99.4	100.0		
1000	41.0	65.1	99.5	100.0	100.0		
			Field Size is 15,000				
100	4.9%	9.6%	39.5%	63.5%	86.9%		
200	9.6	18.9	63.4	86.8	98.3		
500	22.4	39.9	92.2	99.4	100.0		
1000	40.4	64.5	99.4	100.0	100.0		

OUR NATION'S FUTURE

I look to the days and months ahead with confidence. I do not know what the future may hold in store for us. But this is the confidence I do have. I am confident we are going to do our best.

With that I shall be content, and I shall know that we have laid up our treasure in Heaven "where neither moth nor rust doth corrupt, and where thieves do not break through nor steal."

. . . Former President Truman in an address to the National Press Club November 2, 1961

Thomas H. Carroll

Changing Dimensions in Education

Financial management in government both influences and is influenced by developments in education for administration. Business education currently is undergoing a most searching re-examination and the outcome of this process of re-examination inevitably will affect governmental administration. In his Tenth Annual National Symposium Banquet address Dr. Carroll urged all members of the Federal Government Accountants Association to participate in this important process of re-examination.

As one of the nation's new university presidents and as a former teacher of accounting, a former member of the National Commission on Standards of Education and Experience for Certified Public Accountants, a member of Beta Alpha Psi and an honorary CPA of North Carolina, I welcome this opportunity to discuss the implications of new developments in education for administration with the members of the Federal Government Accountants Association. In the context of the symposium theme, "Changing Dimensions," I would like to consider with you some of the changes—revolutionary in nature in my opinion—that have taken place in business education in recent years. The implications of these changes can certainly be great upon the work of the federal accountant, even if at times indirect. They are related to the expanding functions of higher level accountants in both civil and military government.

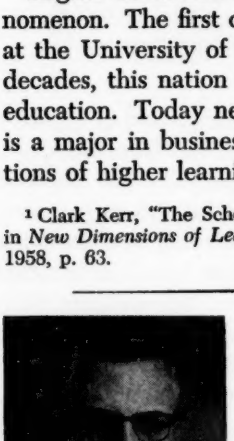
The accountant now is, or should be, the full-fledged coordinator of planning for responsible management. In order to realize this potential most fully, however, he must be alert to the many new developments now going forward in all the functional aspects of the firm or government department. He should also be alert to the relevant developments in education. On this occa-

sion, therefore, it is fitting that we should examine the present status and horizons of business education. What are likely to be the functions and responsibilities of the business school of the future? Business education is currently in a transitional stage from the predominantly vocational orientation of the past to a truly professional status in the future. The present stage comes after a decade or more of ferment. Clark Kerr, President of the University of California, has stated rather dramatically: "Schools of business administration across the nation are trying, sometimes almost desperately, to find their souls." [1] It is a propitious time for each school to evaluate its own aims and programs.

Higher Education for Business

Higher education for business is primarily an American phenomenon. The first collegiate school of business was established at the University of Pennsylvania in the 1880's. In the ensuing decades, this nation witnessed a spectacular growth in business education. Today nearly one graduating college senior in seven is a major in business, including accounting. Some 600 institutions of higher learning have schools or departments of business

[1] Clark Kerr, "The Schools of Business Administration," an address published in *New Dimensions of Learning in a Free Society*, University of Pittsburgh Press, 1958, p. 63.



DR. CARROLL

Thomas Henry Carroll, II, is President of The George Washington University and a director of numerous business firms and professional associations. Dr. Carroll served in the United States Navy during World War II, attaining the rank of Commander, and for seven years was Vice President of the Ford Foundation, the position he held immediately before coming to Washington as President of The George Washington University. He has an extensive background in public service, has both taught and held important administrative posts at four major universities, and has been a frequent contributor to professional journals. Accounting has long been one of Dr. Carroll's fields of professional interest and for three years he was a member of the National Commission on Standards of Education and Experience for Certified Public Accountants. His many professional affiliations include the Controllers Institute of America and the North Carolina Association of Certified Public Accountants (honorary).

administration. These have emerged over the course of time from a variety of backgrounds to serve a variety of needs. As you so well know, many were designed primarily to train graduates for careers in accounting. Others were offshoots of the department of economics. A few were oriented towards preparation for positions of general administrative responsibility. Although they all had a common objective of providing training for business careers, there was a wide diversity of means utilized in approaching that end.

Over the course of time, business education became increasingly characterized by curricula that dealt with business subjects in a narrow, vocational way. Typically, the courses were of a practical nature that stressed prevailing business practice. All too often, the training was out of date by the time the student had a chance to apply it. It is now widely recognized that how-to-do-it techniques are more properly a part of on-the-job training. More serious, however, is the fact that the proliferation of vocational courses in the college curriculum all too often crowded out the broader and more fundamental studies which contribute so much to the breadth of knowledge and qualities of mind that are essential for advancement beyond routine positions.

Two of the major American foundations in recent years gave financial support for and sponsorship to critical studies of business education. The reports are known as the Ford and Carnegie reports, but should more properly be called the Gordon and Pierson reports. They have been widely read in their published forms and discussed. More recently a summary version of the two studies was published in a single small volume under the aegis of the Committee for Economic Development.[2] This has brought even more consideration to and discussion of this vital subject.

Of the major weaknesses emphasized in these studies I should like to mention three that are, I believe, of particular interest to federal accountants. My own observations lead me to accept the conclusions of Gordon that, except for a relatively few institutions, business schools are presently characterized by (1) an excessively narrow and vocational approach, (2) a failure to incor-

[2] See Silk, Leonard S. *The Education of Business Men* in the Current Publications Department of the September 1961 issue of THE FEDERAL ACCOUNTANT.

porate in their program training in the fundamental disciplines relevant to the professional field, and (3) an absence of orientation towards research. On the basis of these findings, recommendations for improvement have been made. These represent the pattern that is *already in existence* in the leading schools and is spreading fairly rapidly. But the pattern is not *characteristic* of the field, especially at the undergraduate level.

New Approaches

What are some of the new approaches that will probably characterize business education in the Sixties? First, there is in process a substantial movement in the direction of less specialization, and this is likely to continue. The tendency is to substitute a few basic courses dealing with broad areas of managerial decision-making for the multiplicity of specialized courses. Courses in administration and organization, economic analysis, and quantitative methods form the essentials of the new curriculum. A course in quantitative methods, for example, subsumes separate courses in accounting, budgeting, forecasting, reporting, statistics, quality control, and operations research.

The precise content of the so-called core curriculum will depend upon the level and purpose of the particular program. The appropriate curriculum for an undergraduate program will be different from that for a post-bachelor professional program. At the undergraduate level, the curriculum for a business major in a liberal arts college will be different from that for a student enrolled in a business school. At the graduate level the master's program will be different for an institution that requires an undergraduate preparation in business from one that requires, or at least recommends, an undergraduate preparation in the liberal arts or in a broadly-based program in engineering, and few of them there are.

It should be a truism that all undergraduate programs concern themselves with providing a liberal education. This aim can be approached creatively either in a liberal arts college or in a professional school of business. For example, at Grinnell College a series of five courses is offered by the economics faculty for students who plan to enter a business career. They are: account-

ing, the capital market, industrial organization, administration, and the business enterprise. The courses are liberal in every sense and each is considered to be an appropriate elective for the student who does not plan a business career as well as for the student who does.

An experiment in the integration of business and non-business courses within the context of an undergraduate business school is going forward at Northwestern University. The curriculum is being revised in the direction of a greater emphasis on liberal education than is the case, I believe, with any other undergraduate business school. Under the new program, the undergraduate student at Northwestern may even elect a non-business field as his principal area of concentration. Four interdisciplinary courses have been developed and are required of all business students: "quantitative controls," "human relations," "business problem analysis and reports," and "competition of ideas in a business society."

The present standards for membership in the American Association of Collegiate Schools of Business require that at least forty per cent of the curriculum for the bachelors degree be taken in subjects other than business and economics. Gordon recommends that this requirement be increased to not less than fifty per cent. Most of the outstanding schools now meet this recommended level. But numerical requirements are not the important element. What is important is that the business and non-business courses in the curriculum be equally broad in outlook and equally rigorous in analytical content. The manner in which a course is taught will have a great bearing upon its liberalizing effects on the student, whether it be a course in English or in business law.

Another feature of the new curricula is that they are becoming increasingly rigorous in content. The how-to-do-it approach is being abandoned. Instead, the emphasis is placed on providing training in the fundamental analytical tools that are essential to the solution of a wide variety of business problems. As an example, let me cite the new experimental master's program at the University of Kansas. This is a bold and ambitious program which breaks with traditional methods and incorporates some of the new concepts in their most advanced form. The first year

program is to be devoted entirely to the study of the behavioral sciences, economic analysis and quantitative methods. It is designed to provide a grasp of the basic concepts and tools of business administration. The second year of the program is conceived of as the "applied" year, in which the knowledge gained in the first year will be used in courses in production, marketing, finance, and organizational behavior.

Graduate Education

At the post-bachelor level the business administrative program is not faced with the necessity of providing a liberal education as such, for this is the function of undergraduate education. The principal objective of the professional master's degree is to provide a suitable preparation for a business career. A greater amount of specialization is in order, but the danger of excessive specialization is still present. Most leading thinkers in the field appear to be in agreement that preparation for a specific job is out of place and should be scrupulously avoided. The objective of the master's program should be rather to provide the fundamental knowledge that will be useful in more than one phase of business, for different needs as they emerge, and for the continuous development of the individual over the years of his career.

To a large extent the changes now taking place in business education are the result of ideas developed in doctoral programs during the past few years. These doctoral programs are directed toward preparation for teaching and research in business administration, rather than for the practice of business as such. New ideas developed at the doctoral level will inevitably have an impact on the fundamental character of future business education and ultimately on business practice and in public administration. For these reasons, special importance attaches to current trends in doctoral programs.

Here I should make clear that I do not subscribe to the view that no one should teach in a school of business and/or public administration without a doctorate. I believe the doctor's degree is most valuable. But it does not follow that business or governmental experience, either in a practicing or in a consulting capacity, is not also valuable for the faculty member. The ideal

business and/or government faculty member should have both scholarship and experience, but we should never confuse the contributions of each. They are *not* interchangeable.

Research in Administration

The concept of research in administration is in the process of undergoing a radical change. Basic research in the sense of a continuing search for new approaches, new ideas, and new methods or new combinations leading to new knowledge originated with Frederick W. Taylor and the scientific management movement in the 1920's. By applying the methods of scientific research to problems of the worker and his job, a number of important discoveries were achieved principally by breaking down the job into its component parts and by time and motion studies. In the 1930's another phase of research in industry was developed by Elton Mayo and his associates at Harvard. Their research, based on experiments at the Western Electric Company by a combined team from the company and the University, was the origin of the field which has come to be known as "human relations in industry." [3]

From these comparatively recent beginnings there has developed the considerable body of literature which now exists in the field of organization theory. A survey of this literature may be found in the recent volume by Herbert A. Simon and James G. March entitled *Organizations.*[4] These authors and their associates at Carnegie Tech are deeply involved in problems of organizational structure, administration behavior, and so-called cognitive aspects of decision-making. Some significant contributions to basic research in business administration have also been made by persons and institutions outside the business schools—by sociologists, psychologists, political scientists and economists. There is great need for more.

Basic research in administration has been greatly strengthened in recent years through the more effective use of quantitative methods. There has been a marked increase in the use of mathematics and statistics, both as an aid to decision-making and as a

[3] *Fundamental Research in Administration,* Carnegie Press, 1953, p. 18.
[4] Published in New York by Wiley, 1958.

powerful tool for research. We now take sample surveys and market research for granted. It is easy to forget that their use was virtually unknown a few decades ago. Similarly, the application of sampling methods to accounting problems is now coming into widespread use. Scaling and psychological measurement, operations research and simulation of complex organizations are among the newer techniques which are finding increasing application to business problems. Some of these methods are feasible, of course, only with the use of high-speed computers.

Specially worthy of note are two major Ford Foundation actions designed to promote the use of quantitative methods in the study of business. The first was the establishment of an experimental Institute of Basic Mathematics for Application to Business. It provided a one-year training program for selected professors of business administration. It was held in Cambridge, Massachusetts, where it had access to the resources of Harvard and M.I.T., from September 1959 to August 1960. There were 41 fellows from 35 universities in attendance. The objective was not to set education for management in an operations research mould. It was, rather, to enable leaders in education for administration to know what the potentialities and limitations of mathematical methods as applied to problems in administration are. The effects upon teaching and research could be very great.

The second action was the establishment of a Western Management Science Institute in Los Angeles in cooperation with the Western Data Processing Center at the University of California (Los Angeles). The purpose of the Foundation grant was to provide a demonstration of the potential use of quantitative methods and of electronic computing machines in research on management problems.

The new behavioral and quantitative methods appear to be in the process of transforming the study of management from an essentially descriptive to a more rigorous, scientific approach. The impact of the new developments on teaching methods is already apparent. Formidable new weapons have been added to the teaching arsenal to serve along with the case method that was designed to develop orderly, analytical, problem-solving ability. Chief among them is the "business game," which simu-

lates business situations with or without electronic computers; it adds dynamic dimensions to problem-solving. Other methods include role playing, laboratory experimentation, and other forms of simulation.

One of the most disappointing aspects of management education has been the notable failure to combine business and public administration in a really effective way. There are a few schools of so-called business and public administration. They generally operate two quite separate programs. What is still needed is their effective combination in one curriculum with resultant mutual impact and increased professional understanding. We at The George Washington University think we have gone fairly far on a comparative basis, but we have only scratched the surface of the vast potential.

Outlook for the Future

We seem to be clearly on the threshold of great changes in both education for and the practice of administration. I have indicated some of the lines along which I believe we can expect these changes to occur in the next decade. As these new concepts spread, they can and should be adapted and improved. New ideas, not yet on the horizon, will undoubtedly emerge.

It is a solemn responsibility of the educators to maintain, even increase, the momentum that has been achieved. It will require adherence to rigorous standards of teaching in all of our colleges and universities and full support of basic research by both education on the one hand and business and government on the other. Only in this way will education justify itself as the dynamic force that will enable business and government to make maximum contribution to national and world-wide economic and social well-being.

Raymond Einhorn

Some Current Financial Management Problems of Federal Agencies

Each year in May the President of the Federal Government Accountants Association addresses the Annual Institute on Accounting held on the campus of The Ohio State University. In this article Raymond Einhorn provides a summary of developments in the Federal Government as presented at the last Annual Institute on Accounting.

Improvements in financial management in the Federal Government during the 1950's have been impressive but the challenge of the 1960's calls for some reevaluation. One of the problems today is the lack of adequate communication between financial management and operating management. Attention is also too often concentrated, even today, on the control of funds with the consequent lack of adequate attention to agency performance.

The President of the United States, on the occasion of the Tenth Annual Symposium of the Federal Government Accountants Association, stressed two things—prudent stewardship of our public funds and effective results for every dollar expended—and enlisted our support and earnest cooperation in these objectives. The financial management improvements and problems of government agencies should be of vital interest to all taxpayers and citizens of the nation. If the improvement in financial management in Federal agencies continues, and if the types of problems I shall describe are solved, the savings will be quite significant.

My discussion of some of the current financial management problems of Federal agencies should be introduced by three brief statements:

First, I am discussing the internal problems of the agencies and not their external problems and not the Government as a whole.

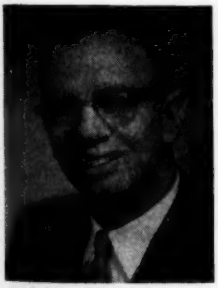
Second, I am not discussing the financial management problems of the Congress or of the Treasury, such as those relating to the financing of expenditures. Nor am I discussing matters related to the General Accounting Office audits, the Bureau of the Budget reviews of the budgets of individual agencies and of the entire budget, the President's presentation of the budget, or many of the other problems relating to the balancing of the budget.

Third, I am only discussing some of the problems. I am choosing, from those that I am aware of, some of the ones that I think will be of special interest. There are other problems that are quite technical which could be discussed at length and which would be very significant, particularly to practitioners and teachers.

Perspective on Improvements and Problems [1]

The improvements in the last ten years have been tremendous when you consider and evaluate them in the circumstances of the complexity of the Federal Government, the great variety of

[1] *See Financial Management in the Federal Government,* Part I, "Background," December 30, 1960, pp. 3-26. Prepared by Committee on Government Operations, United States Senate. U.S. Government Printing Office, Washington, D.C., 1961.



MR. EINHORN

Raymond Einhorn, immediate past president of the Federal Government Accountants Association is Director of Audits for the National Aeronautics and Space Administration. A certified public accountant, Mr. Einhorn has some 19 years of responsible Federal service to his credit, including Chief of the Office of Price Administration's Food Accounting Branch, Chief of the Economic Cooperation Administration's Internal Auditing Branch, and Associate Director of the General Accounting Office's Accounting and Auditing Policy Staff. For a number of years prior to World War II, Mr. Einhorn was Assistant Professor of Accounting at Mississippi State College and for many years has both written and lectured extensively on financial management subjects. His professional affiliations include, in addition to the Federal Government Accountants Association, the American Institute of Certified Public Accountants, the American Accounting Association and the Institute of Internal Auditors.

projects, and the diversity of assignments that agencies have. Only those most familiar with the progress that has been made, such as Eric Kohler, Walter Frese, Paul Green and the many members of the American Institute of Certified Public Accountants who have reviewed what has happened in Washington, fully realize what a magnificent tribute is due the dedicated people who continuously strive to improve government efficiency and economy.

After Congress had established the budgeting, accounting, auditing and related functions of the General Accounting Office, the Bureau of the Budget and the Treasury Department in 1921, we moved to an era of standardized procedures and regulations and uniformity in the Government, including annual budgets based on cash receipts and disbursements and obligations authorized, incurred and liquidated. This era extended through World War II and for a number of years thereafter.

With the vast increase in expenditures in World War II and the formation of many new agencies, there was a major recognition of the need for some change. About 1948 to 1951 we moved away from the era of prescribed uniform systems, mandatory procedures and standard forms. We began to move away from budgeting for an agency primarily in terms of its obligations and disbursements, classified by object of expenditure. We began to move away rather decidedly from centralized accounting, bookkeeping and auditing. As the operational responsibilities of management were further decentralized within the agencies, new financial management concepts of controls and systems were developed. It was recognized that accounting systems must be tailored to the needs of each agency. The General Accounting Office, therefore, in 1952 and 1954 issued statements of accounting principles and standards, instead of prescribing accounting procedures, forms and regulations. These accounting principles and standards and illustrative procedures appear in Title 2 of the *General Accounting Office Policy and Procedures Manual for the Guidance of Federal Agencies.*[2]

In budgetary planning and execution, more emphasis began to

[2] Available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

be placed on the activities and functions performed, instead of on objects of expenditure. In lieu of accounting records based almost entirely on the types of authority granted by the Congress, that is, the authority to order goods and services and the authority to disburse for them when received, we began to have a rapid development of accrual accounting. In some instances in the 1950's, accounting was also developed on the basis of the responsibilities assigned to the various organizational elements of the agencies. Units of measurement of work performed were used in more agencies—units which were related to the agency's functions and activities, and to its sub-functions and sub-activities. Gradually budgeting and accounting developed in a number of agencies on the basis of costs of goods and services used or applied.

We also had some changes in the disbursing activities of the Government. There was some decentralization, some streamlining. Electronic data processing came on the scene and produced some remarkable changes in mass volume operations, for example in the Treasury Department, which issues over 400 million checks a year, and similarly in the Post Office Department, which issues in the neighborhood of 325 million money orders a year.

New legislation was enacted, including the Budgeting and Accounting Procedures Act of 1950. This act expanded the role of the central agencies in providing guidelines to the operating agencies. In 1948 the Joint Accounting Improvement Program, now called the Joint Program to Improve Financial Management, started.[3] This Joint Program is a cooperative venture of the three central financial agencies, the General Accounting Office, the Bureau of the Budget and the Treasury Department, and the operating agencies of the Government. Under this legislation and program the Legislative and the Executive Branches of the Government joined hands to improve the financial management concepts, methods and procedures throughout the entire Government. For the past several years there has been more emphasis on the comprehensive review, evaluation and revision of

[3] Described in the brochure "The Joint Program for Improving Accounting in the Federal Government," May, 1953, prepared by the Bureau of the Budget, the Treasury Department, and the General Accounting Office. 26 pp.

agency financial management systems. Although much has been accomplished, a great deal more needs to be done in developing agency practices so that meaningful data can be developed for and used effectively by management.

Another major development in the 1950's was the institution of internal auditing on the broad concepts now found extensively in the Federal Government. Several Federal agencies have been leaders in the recent internal auditing developments in government and industry.

There were many other developments in the 1950's which I am not going to describe at this time, such as the outstanding comprehensive audit program of the General Accounting Office. However, I shall mention briefly electronic data processing. At the end of 1960 there were approximately 540 computers installed, exclusive of those for tactical and intelligence purposes, and 310 of these were for business and management systems. Many more have been installed this year.[4]

Challenge of the 1960's

In the late 1950's and the early 1960's there has been more recognition that the excellent earlier plan of central agencies developing and installing accounting systems or helping to develop and install and even helping to operate the systems, was no longer suitable. There has been an ever-increasing understanding that the Congress and the President have assigned the responsibility for good financial management directly to the head of each agency. There is a need for even stronger leadership and guidelines from the central agencies, but the responsibility is basically that of each agency. This is a do-it-yourself age, not as a fad but as a matter of long-range philosophy. The responsibility to improve financial management in Federal agencies lies with the management personnel of each agency, both financial and operational.

Another outstanding characteristic of the 1960's is the firm

[4] Also see data of the Bureau of the Budget and other information in *Report on the Use of Electronic Data Processing Equipment in the Federal Government*, Committee on Post Office and Civil Service, House of Representatives, August 31, 1960, 113 pp. Available from Superintendent of Documents, U.S. Govt. Printing Office, Washington 25, D.C.

awareness in many quarters of the necessity of having a system of budgeting, accounting and reporting tied to planned and actual performance. This awareness has been coupled with a comprehension of the potential of accomplishing this type of financial management with the high caliber of personnel and the advanced concepts, improved methods and scientific tools that are becoming more prevalent in most agencies.

It might be well to mention also that too many are unduly impressed with the size of the Federal Government. The Federal Government is large, and one of its problems is just plain hugeness, but size is not the big problem. In fact, there is little to be gained in discussing problems solely in terms of the size of the numbers that are involved.

The Communication Problem

One of the important problems today in the Federal Government is a lack of adequate communication between the financial management specialists and the operational management personnel. This is a common weakness in management, both in government and outside of government. Communication is one of the management controls that always seems to need attention.

There currently is much discussion in acccounting circles of the need for conveying more clearly what we accountants mean. Examples are the current analyses of "generally accepted accounting principles." The literature, not only accounting journals but other publications, points out that different accountants using generally accepted accounting principles can have two sets of answers for the same set of circumstances. There are some excellent responses to this problem, and not everyone is in agreement that there is a problem. Nevertheless there is certainly a need for more and better communication, and the American Institute of Certified Public Accountants and several other professional associations are studying the matter. The communication problem is not therefore unique to this area within the Federal Government.

I can divide the problem in the Federal Government into two parts: First the financial management personnel—accountants, budget officers and others—having achieved significant improvement among themselves, must become more program-oriented.

They must recognize in sympathetic terms the daily problems, wants, needs and decision-making processes of those who are charged with operational performance responsibilities. They must be more responsive to the needs of the diverse users of the data. Unfortunately, our audiences in the Federal Government are very heterogeneous; the lack of homogeneity is characteristic.

Financial management executives must have a better understanding in terms of day-to-day and long-range operating goals, problems and accomplishments in their respective agencies. More attention must be given to the various financial and non-financial means of measuring and evaluating performance, and to the various yardsticks, standards and other gauges which provide not only a requirement for but an incentive to good performance.

Second, as you may expect, there are two sides to this coin, and several authors are trying to appeal to the second side. Partially paralleling the first problem is a need on the part of operational management to take advantage of the opportunities now provided through the application of modern financial management concepts, principles and procedures. It is not enough to accept the data presented by the financial specialists. There must be a demand by the operators in order to motivate and "aggravate" the action of the accountants, budget officers and others engaged in financial management.

As a corollary, it is likewise not enough to assume that the financial reports being issued are used and useful. There should be a constant surveillance and evaluation, through supervisory channels and through internal auditors, to appraise the financial reports.

Why These Inadequacies?

We can ask, Why are accounting and budgeting executives not sufficiently program-oriented? Perhaps they and some of the operational executives are too exclusively concerned with the accountability for the authority granted by the Congress to place orders—the obligational authority—and with the related disbursing authority. Perhaps they are too exclusively concerned with the accounting and accountability for the amounts used and the

amounts remaining, and with the necessary legal restrictions which it is so important for them to conform to. This can be expressed in the form of two questions: First, are the grants of authority from the Congress (appropriations), and the grants of authority within the agency (allotments), and the other fund subdivisions (such as revolving funds), the chief budgeting, accounting and reporting entities? Secondly, what is the concept of responsibility reporting in Federal agencies? Maybe these are the two basic questions.

It is necessary that we make our financial plans in Government, develop our programs and budgets, do our accounting and reporting, and make our evaluations in financial terms in the way that our agency is organized to do its business. Its long-range objectives and missions must likewise be kept in mind as centers or units for which costs and other financial and operating data should be developed, reported and projected. If a policy of responsibility accounting and reporting is adopted and followed, there will be set forth for management consideration and decision-making numerous comparisons, including those resulting from comparing alternative courses of action.

The Accounting Entities

There is a confusion in the Federal Government as to what the accounting entity is. Unfortunately there is more than one type of entity, although we sometimes assume in Government that there is only one. The Congress appropriates money to the agencies in the manner it does for its own control, and the agencies in turn subdivide this authority. These appropriations and subdivisions, and the working capital and other revolving funds, become entities for budgeting, accounting and reporting purposes.

There is another side. The operating entities are the organizational elements, the functions and the activities of the agency. The budgeting and accounting must also be done in terms of operating entities, in order to emphasize performance on the basis of costs.

We should, I think, analyze the problem areas in the Federal Government by examining some of the basic postulates, attributes

and premises of Federal accounting and budgeting.[5] Very little of this has been done. The common postulates that we hear about, such as those related to continuity, the entity theory, fund sanctity and preservation of capital, and periodicity, should be examined and explored to see if the problems as well as some of the solutions will be disclosed. For example, the entity postulates could be stated this way in the Federal Government: The agency and its field offices, at least for budgeting, accounting and reporting purposes, are financial entities, as are each of its appropriations and other fund subdivisions. We can then recognize that there is a question whether the emphasis should be on the accounting for fund entities alone, as is sometimes done, or on the operating organization as well, including its cash, inventories, equipment, real property and all other resources. The availability of punched card or more sophisticated data-processing equipment is not a basis for the decision. The answer depends on whether there is recognition of management's responsibility for all the resources and whether they are used to manage the operating entity in terms of the organizational units, functions, activities and end products.

Where all the resources are recognized, plans and budgets will take into account the availability not only of the cash assets, but also the equipment and inventories on hand. Consideration is given to other factors, such as the inventory levels that must be maintained and the application of materials and supplies to carry out assigned functions. Managerial reporting will follow. Costs of each function, activity and organizational unit become more important. Costs of performance in the period receive emphasis, rather than only the monetary amount of goods and services ordered and the payments made. Comparisons are made with plans and budgets and hence those requiring revision come up for management consideration.

This does not mean that the accounting for the appropriations and the other fund entities is secondary in importance to accounting for the operating entity. In the Federal Government, accounting for the fund entities must be accomplished to meet the require-

[5] See "Some Premises Underlying Federal Agency Financial Management Processes," Raymond Einhorn, THE FEDERAL ACCOUNTANT, Volume X, Number 4, June, 1961, pp. 48-54.

ments of law and to maintain control over the use of the authorized funds. In this area, as in many others, there are streamlined methods of accounting. This fund accounting and reporting should not overshadow the significance of the reason for the agency's existence, that is, the performance of its assigned objectives. Budgeting and accounting in the Government must serve the somewhat diverse needs of many interested parties—the Congress, the Bureau of the Budget, other central agencies and the public—as well as those of the operating management of the agency itself. The needs of operating management come first, since this is the organization with the basic responsibility. Performance is the paramount objective in which all the Government levels are interested. This principle of having a fund entity and an operating entity is, of course, recognized in a number of Government publications, including those of the General Accounting Office and the Bureau of the Budget.

Summary

I shall recapitulate a few of the things I have said in a little different fashion and highlight both the accomplishments and the problems:

- Accounting principles and standards have been developed, prescribed and illustrated by the Comptroller General for the accounting guidance of agencies, but many agencies do not have accounting systems which have been approved by the Comptroller General. Many agencies do not have budgeting systems based on performance and in accord with the related accounting and reporting endorsed by the Bureau of the Budget in its guidelines.
- The use of cost data, the dollar amounts of goods and services applied to carry out the objectives and tasks of the agencies, has increased tremendously. So has the accounting for property and other assets, and for liabilities. But there are extensive and significant areas where the primary financial data are in terms of only orders and contracts placed and disbursements made.
- In a great many cases, accrual accounting techniques and cost budgeting are used only for accumulating data for

presentation to the Congress and others. In many of these cases there is a lack of assurance that the agencies are effectively using these techniques and tools in their internal operations.

- Cost consciousness must be developed at the point where costs can best be controlled—that is, by the operating management of each agency. There is a need for greater use of methods and techniques such as operating budgets constructed on the basis of the planned cost of performance; cost standards and targets; work measurement and cost accounting tied into work measurement; and for the application of these methods in the framework of recent developments, such as automatic data processing systems.
- There is some confusion as to what accrual accounting is. Accrual accounting in government is often thought of only in terms of recording transactions in the period in which the transactions occur. There is not enough recognition of the more basic concept that accounting and the related budgeting and reporting must first be aligned with the way management responsibilities are assigned. This basic concept should be recognized regardless of the pattern established for financing the agency.
- The enormous costs that are incurred, once programs of the magnitude and significance that we have in the Federal Government are begun, must be estimated and considered in advance by management before making decisions. This is too often not done. It is essential that the costs of alternative courses of action be projected and disclosed for evaluation before irrevocable or wasteful actions are taken. Costs of this type *span* appropriations and other sources of financing, *cut across* organization lines, and *stretch* from the planning through research and development, design, production, application and finally maintenance over the years.

Are There Solutions?

Are there solutions to these problems? Yes, there are some. They are coming from dedicated personnel in the central financial agencies, from equally dedicated personnel in each operating

agency with the basic responsibility for performance, and from all those who are sponsoring and supporting the Joint Program to Improve Financial Management in the Government. Likewise, there is inspiration as well as guidance from the numerous agency training programs, the Civil Service Commission with its Financial Management Institutes and other training activities,[6] and the symposiums and seminars of the Federal Government Accountants Association.

The story would be incomplete without once again recognizing the efforts of many outstanding individuals in the Government, and some who have left, the numerous university graduates who come into the Government each year, and the work of the Congress, including its enactment of the Budget and Accounting Procedures Act of 1950 and the annual reviews that it gives each agency. The story also would be incomplete without appropriate recognition of the reappraisal programs in effect in some agencies. Over and above these, however, is the responsibility of each citizen, in his role as taxpayer, to become interested in and to contribute his attention and knowledge to the effective resolution of the problems confronting the Federal Government.

At the Tenth Annual National Symposium of the Federal Government Accountants Association I received a telegram from the President of the United States addressed to me as President of the Federal Government Accountants Association. I will conclude with this challenging telegram.

> "On this, the occasion of your Tenth Annual National Symposium, I extend my greetings and congratulations. Yours is a young and vigorous association that I know has contributed increasingly toward the resolution of Federal financial management problems over the past ten years. The next decade will be even more demanding. Your membership will face numerous challenges as we work toward our goals of stimulating national growth and satisfying essential public needs. The subject of your Symposium, 'Changing Dimensions of Financial Management in the Federal Government,' gives evidence of

[6] For example, see the brochure, *Digest of Proceedings, Financial Management Institute*, Fall of 1958 and April-May, 1960, U.S. Civil Service Commission Washington 25, D.C.

your awareness of the problems ahead. I wish you well in this endeavor. As Federal accountants and financial managers, I would stress to you two things. We must have prudent stewardship of our public funds; and we must obtain effective results for every dollar expended. The resources of this administration are directed toward these objectives. I enlist your support and earnest cooperation."

(Signed)
JOHN F. KENNEDY"

FIVE TIPS FOR PIPE SMOKING

For the accountant who wants to smoke a pipe but can't seem to get the knack, Esquire *magazine offered some helpful hints in the June, 1961 issue.*

"Pipe smoking is a grace and a joy that is acquired, much perhaps in the fashion that an immovable stone gathers moss. It just happens," says author Franklin Reynolds. He says "A man must acquire the art, or grace, or whatever it is, in philosophical meditation, in communion only with his pipe, his tobacco and himself."

He offers these tips for newcomers to pipe smoking:

1. Don't use just one pipe. Buy two or three of the best pipes you can afford. Use them in rotation. The bowl should never be hot or wet when you use it.

2. Avoid heavy or long-stemmed pipes at the outset. A short, or curved stem will mean less weight to hold in your mouth. Comfort is more important than appearance of the pipe.

3. Pack it right—not too tight, not too loose. If it's too tight, it will be hard to light and keep going. If it's packed too loose, it will burn too hot.

4. With a new pipe, fill only half the bowl the first few times. And smoke it down to the bottom. Then you can gradually increase the amount until you start with a full bowl.

5. Clean your pipes regularly. When you remove the ashes, don't tap the rim of the bowl against anything harder than the palm of your hand.

NEWS FEATURE

How The American Institute Conducts Accounting Research

James O. Eaton

Chairman, National Research Committee
Federal Government Accountants Association

Two years ago after an intensive study of its existing accounting research program the American Institute of Certified Public Accountants completely reorganized its approach to research. Previously the research program had been carried on by the Committee on Accounting Procedure with the assistance of a small research staff employed by the Institute. The principal function of this committee had been to consider various accounting problems and then to issue research bulletins expressing its views on the subject. These well known bulletins have served to clarify and to some extent standardize accounting practice but were never particularly effective in developing basic research on underlying problems.

A special committee was appointed in 1957 to review the whole problem of accounting research and to make recommendations regarding the way in which these problems should be handled in the future. This special committee rendered its report in September, 1958, and the recommendations made in the report were adopted with only minor modifications by the Council of the American Institute in April, 1959. The new organization was put into effect in September, 1959, and ten research projects currently are in progress under the new arrangements.

Basic Considerations

In adopting this new approach to research, the American Institute acknowledged its basic responsibility to advance the written expression of what constitutes generally accepted accounting principles, for the guidance of its members and others. It also affirmed its special committee's concept that generally accepted accounting principles are more than merely a concensus of existing practice and accordingly it declared its responsibility both to determine appropriate practice

and to narrow the areas of difference and inconsistency in practice. While its approach is announced to be one of persuasion rather than compulsion, the Institute seeks to lead the accounting profession in resolving unsettled and controversial issues.

The broad problem of financial accounting is visualized as requiring attention at four different levels:

First, postulates, which are few in number, being the basic assumptions on which principles rest.

Second, principles which, together with the postulates, serve as a framework of reference for the solution of detailed problems.

Third, rules or other guides for the application of principles in specific situations, much as the accounting research bulletins have served.

Fourth, research adequate to provide a sound base for pronouncements on accounting matters.

Institute Organization for Research

The organization for conducting Institute research and related activities now consists of an Accounting Principles Board and an Accounting Research Division. The Board has eighteen members, all of whom are elected by the Institute Council for three-year staggered terms. It ranks as the senior technical committee in the Institute and is the only group authorized to make pronouncements on accounting principles. The Accounting Research Division is headed by a Director of Accounting Research and has a full-time professional and secretarial staff which is supplemented on specific projects by temporary personnel obtained primarily from educational institutions.

Each research project is developed through a number of formally planned stages. Completed research studies, after review by project advisory committees, are exposed for comment by individuals and groups both within and outside the public accounting profession. Advisory committees, each of which is chaired by a member of the Accounting Principles Board, are drawn from the ranks of certified public accountants and other experts in such various fields as teaching and industry.

The principal products of the program will be a series of accounting research studies and a series of statements on generally accepted accounting principles. Research results are published on the authority of the Director of Accounting Research, in order to expose their tentative solutions for consideration and experimentation on the part of the profession and the public. At this point the conclusions and suggested solutions are to be considered informative, but tentative, and not highly authoritative. After publication or other exposure, conclusions from research studies will be considered by the Accounting Principles

Board for possible adoption as Statements of Generally Accepted Accounting Principles.

To date, ten projects have been announced, including three this past summer. A general summary of these projects follows, together with a brief commentary on the three new projects. Any individual or group desiring to do so is urged to submit comments, suggestions or other materials relating to a project, to the Director of Accounting Research, American Institute of Certified Public Accountants, 270 Madison Avenue, New York 16, New York.

Summary of Research Projects

PROJECT NO. 1: Basic Postulates and Broad Principles of Accounting

This basic project was proposed by the Institute's Special Committee on Research Program in recommending the new research arrangements. In the words of the special committee:

> "An immediate project of the accounting research staff should be a study of the basic postulates underlying accounting principles generally. . . . There should be also a study of the broad principles of accounting, and the preparation of a reasonably condensed statement thereof, similar in scope to the statements of the American Accounting Association. The result . . . should serve as the foundation for the entire body of future pronouncements by the Institute on accounting matters. . . ."

A draft of proposed basic postulates has been printed and is being circulated for comment. The draft study is about the size of one of the American Accounting Association's monographs.

Project Director: Dr. Maurice Moonitz, now the Institute's Director of Accounting Research and formerly, at the time the project was announced, Professor of Accounting in the University of California at Berkeley.

PROJECT NO. 2: Accounting for Income Taxes

Particular attention is being paid in this study to the problems of income tax allocation among accounting periods where certain transactions reported on the income tax return are reflected in an earlier or later period on the financial statements. The study, which is now in a draft status, will also include the treatment of loss years, allocation among sections of the financial statements, the handling of net operating loss carryback and carryforward adjustments, and other related problems. Previous pronouncements on this subject appear in Accounting Research Bulletins Nos. 43 (Chapters 9(c), 10(b) and 15), 44 and 44 (Revised), and 51.

Project Director: Professor H. A. Black, Florida State University.

PROJECT NO. 3: Accounting for Leases

This study, which also is in draft status, deals with problems associated with the increased use of equipment leases and of sale-and-lease-back arrangements, and with the possibility of capitalizing future rental payments for financial statement purposes. These matters are being considered from the standpoints of both the lessee and lessor. A previous pronouncement on the subject of this study appears in Accounting Research Bulletin No. 43, Chapter 14.

Project Director: Professor John H. Myers, Northwestern University.

PROJECT NO. 4: Business Combinations

The working draft of this study deals mainly with the classification of acquisitions as poolings of interest or purchases. Differences between the two lie in the treatment of intangibles and retained earnings. A previous pronouncment on this subject appears in Accounting Research Bulletin No. 48.

Project Director: Professor Arthur R. Wyatt, University of Illinois.

PROJECT NO. 5: Accounting for Nonprofit Organizations

Attention is being focused in this study, which currently is in a preliminary draft stage, upon the accounting problems of governmental units, public school units, state-supported institutions, some privately supported organizations (where initial capital or a significant portion of income is realized from nonequity sources), health and welfare organizations, churches, labor unions, and certain foundations. The study concentrates on the major accounting problems and general principles peculiar to these organizations and is not concerned with their bookkeeping or accounting systems. Consideration is being given to the extent to which accounting principles applicable to business organizations operated for a profit are appropriate for nonprofit organizations. Mutual savings banks, cooperatives and private dues-sustained clubs have been excluded.

Project Director: Professor Emerson O. Henke, Baylor University.

PROJECT NO. 6: Cash-Flow Statements and Analysis

For many years the literature of accounting has included the preparation of financial statements under the title of "Statement of Source and Application of Funds" or some similar characterization. This study has already progressed through several draft stages and excerpts from one of the draft versions appeared in the March 1961 issue of *The Journal of Accountancy* under the subject "Cash Flow Analysis and Funds Statements." The study includes a survey of practice in the use of funds statements and contains a critique of the form of presentation and an analysis of the function of this type of financial

exhibit. Work to date has disclosed a considerable misuse of cash-flow calculations and has found rather widespread support for the broader use of funds statements in general. The research on this project did not extend into the area of cash budgeting or similar managerial problems. It focused instead upon the information provided for stockholders, investors and others interested in the annual reports of corporations and other business enterprises.

Project Director: Mr. Perry Mason, the Institute's Associate Director of Accounting Research.

PROJECT NO. 7: Accounting for Cost of Pension Plans

An already completed draft of this project study explores the division of labor between actuaries and accountants and points up the consequences of applying accrual accounting principles to the problem of accounting for pension costs. Previous pronouncements on pension accounting appear in Accounting Research Bulletins Nos. 43, Chapter 13(a), and 47.

Project Director: Mr. Alexander Russ, Institute Research Supervisor.

PROJECT NO. 8: Accounting for Foreign Operations

A new study announced last summer will include an examination of trends in the nature and objectives of foreign investment by United States corporations, with emphasis on their effects on the reporting of the results of that investment. Particular attention will be given to the development of appropriate procedures for the translation of foreign currency balances into dollars, the impact of governmental intervention in the area of exchange rates and currency convertibility, and the problems relating to foreign subsidiaries in the preparation of consolidated and parent company financial statements. A previous pronouncement on the general subject of this new study appears in Accounting Research Bulletin No. 43, Chapter 12.

Project Director: Professor S. R. Hepworth, University of Michigan.

Comment: There is considerable evidence available to indicate the timeliness of this project. Government statistics show, for example, that over 800 American firms began foreign operations in Europe during the past three years, and that direct American investments in Europe now exceed $6.3 billions. The term being applied to this business movement is "internationalization" and the probabilities are that this movement will be extended into Latin America to spearhead industrial development there. There are many peculiarities of foreign operations to plague Americans doing business abroad, most of which manifest themselves in the accounting for these operations. It is noteworthy that the National Association of Accountants published a

research project report on "Management Accounting Problems in Foreign Operations" in 1960.

PROJECT NO. 9: Price Level Changes

First announced last summer, this new study is proceeding on the assumption that to ignore fluctuations in the value of the dollar in accounting is unrealistic. Under instructions from the Accounting Principles Board, this study will also pay special attention to the use of supplementary statements as a means of disclosure, but the study will not be restricted to that aspect of the topic. A major objective of the new study is to review earlier conclusions and recommendations in Accounting Research Bulletin No. 43, Chapter 9(a), and in the independent report of the Institute sponsored Study Group on Business Income, which was published in 1952 under the title "Changing Concepts of Business Income" and dealt with the impact of changing prices on business income.

Project Direction: Professor Philip W. Bell of Haverford College is preparing a report on the consequences to accounting of price-level changes, Mr. Perry W. Mason assisted by Mr. Leonard Lorensen is surveying techniques involved in making price-level adjustments, and Alexander Russ and Cecilia Tierney, both of the Institute's accounting research staff, are investigating the index-number problem.

Comment: Many previous studies have dealt with price-level problems, notably the 1956 joint study of the American Accounting Association and the Merrill Foundation for Advancement of Financial Knowledge under Professor Ralph C. Jones of Yale University and the Institute's 1958 "Opinion Survey on Price-Level Adjustment of Depreciation" published in the April 1958 issue of *The Journal of Accountancy.*

For the most part these studies may be described as largely exploratory in nature but they foreshadowed the urgent need for further study to give thorough consideration to strong criticism reflecting upon the acquisition-cost basis of income measurement. Federal accountants can be expected to follow this study with special interest because it will have ramifications possibly impinging upon requirements of the Securities and Exchange Commission, the Internal Revenue Service and Government procurement offices, to cite merely a few.

PROJECT NO. 10: Intercorporate Investments

A major objective of this new study will be to review and amplify a pronouncement of the Committee on Accounting Procedure, Accounting Research Bulletin No. 51, Consolidated Financial Statements. Particular attention will be given to the problems which are created

by the existence of unconsolidated subsidiary companies. The timing of the recognition of earnings of an unconsolidated subsidiary in a consolidated statement will be examined, as well as the extent of supplementary disclosures. In addition, the entire range of problems encountered in the preparation of consolidated financial statements will be studied.

The related parent-company problems will be given special attention. These include the amount at which the investment in the subsidiary is included in the assets of the parent corporation, and the recognition of earnings of the subsidiary on the financial statements of the parent. Another area of emphasis will be problems created by the existence of associated or fifty-per-cent jointly-owned companies. Consideration will also be given to such problems as the accounting for equity securities in uncontrolled affiliates and holdings of debt securities of other corporations.

Project Director: Professor S. R. Hepworth, University of Michigan. *Comment:* Accounting Research Bulletin No. 51 is based upon a 1956 Institute study, "Survey of Consolidated Financial Statement Practices," which disclosed a wide diversity of practices. Some of the diversity is attributable directly to peculiarities of certain businesses and some to a lack of concensus regarding informative reporting. The research bulletin drew the various viewpoints into focus. The prospectus of this newly-announced project is ambitious in view of the scope of the problem, but in turn underscores its significance and dimensions.

WHERE ELSE BUT AT INTERSTATE COMMERCE

While an official dictating an article on depreciation paused after his lead sentence, "There is no question as to the relationship of maintenance to depreciation," his modish middle-aged secretary interrupted with this: "Sir, I'm not so sure about that. I have little trouble in keeping up with the maintenance; it's the depreciation I can't cope with."

SPECIAL REPORT

Education for a Career in Government

Nine prominent educators serving as consultants to the Comptroller General of the United States urge sufficient undergraduate specialization in accounting to qualify students for professional careers with the General Accounting Office.

We believe in the importance of the study of accounting in our modern collegiate education and in the desirability of maintaining an adequate undegraduate program in the field of accounting. Our strong convictions in these matters have developed through our relationships with educators and educational institutions, from our contacts with employers and employees of accountants, and specifically as a result of our service as consultants to the Comptroller General of the United States, the head of one of the most significant and responsible Federal agencies—the United States General Accounting Office.

Shortly after his appointment to a 15-year term as Comptroller General, Mr. Joseph Campbell, CPA, named a panel of educators as consultants to help him and his department heads plan more efficient and effective programs for (a) the recruitment of accountants and auditors for the Office, and (b) the continuing education and development of its professional staff members. This group has met with Mr. Campbell two or three times each year for the past six years. In recent meetings, Mr. Campbell, his staff, and the consultants have discussed and explored the possible impact of current trends in education for business and accounting on future employment needs of the General Accounting Office as well as on its staff training and development needs. Thus, we have been in a good position to observe firsthand the correlation of the responsibilities and duties of the professional accountants and auditors of the General Accounting Office with their educational preparation.

The United States General Accounting Office, now in its 41st year, is the agency of the Congress charged with the responsibility of reviewing the activities and auditing the financial affairs of agencies of the Federal Government. The Congress requires that the Office furnish formal reports based on independent examinations of the

operations of each Federal agency. These numerous reports have provided much valuable information to the Congress, the agencies, and the public on the conduct of the financial operations of the many defense and civilian departments and agencies.

The promotion of adequate and strong financial management in the Federal Government has been an objective of the General Accounting Office for years. Post World War II developments and changes in the basic philosophy of financial management in the Federal Government have been taken into consideration by the General Accounting Office in discharging its responsibility to the Congress and to the American public. While the responsibilities for the accounting work of the agencies, and the internal controls involved therein, are largely those of the agencies themselves, the General Accounting Office is required by law to prescribe accounting principles and standards for agency use; to cooperate in the development of agency accounting systems; to approve the systems used; and to make examinations of the manner in which the agencies are discharging their financial responsibilities. The review and appraisal of the performance of agency operations becomes a vital part of the work required to be done and the General Accounting Office is now devoting a major portion of its energies to that activity. This concept of the duties and responsibilities of the General Accounting Office requires that each of its professional staff members have a thorough grasp not only of technical accounting and financial matters, but also a broad comprehension of management principles, agency objectives, and performance standards in achieving those objectives.

A policy objective of the Comptroller General is to improve the scope and effectiveness of General Accounting Office examinations without adding materially to the number of employees. While the backgrounds and types of persons working for the Office have changed perceptibly each year, the over-all number of employees of the General Accounting Office has decreased significantly in the past decade. However, the staff responsible for the review of agency management, which is most important and obviously requires individuals with wide knowledge and judgment of administration broadly conceived, has shown a remarkable increase during the past six years. This increase in the professional staff members is in keeping with the enlarged sphere of responsibility given to the Office and to the gradual elimination of routine checking and voucher auditing.

The professional accounting staff of the General Accounting Office now numbers about 2,000. Almost all of these professional individuals were graduated from our collegiate schools or departments of business administration with an accounting major. In order to maintain an

adequate professional staff to handle the continually increasing demands on the General Accounting Office, it is necessary to recruit annually about 300 graduates of accounting major programs. Thus, the General Accounting Office is one of the largest single employers of graduates of schools and departments of business. A very serious and deep responsibility rests upon the Office to obtain highly qualified and personable staff members who have the potentiality to review the varied and complex management activities of Federal agencies and departments.

We share the view of the officials of the General Accounting Office that collegiate education for business and accounting should not remain static in curricula or approach. However, in view of the need each year of the General Accounting Office for additional persons of professional quality and potential, we are of the opinion that this should consist of an absolute minimum of 18 semester hours of accounting instruction, but that as much as 24 semester hours, including the basic course, may be highly desirable as a minimum requirement for a major in the subject. In addition to the accounting, it is our judgment that education in the broad area of business administration, including the basic functional fields prescribed by the American Association of Collegiate Schools of Business, should be required of all graduates so that the accounting, other business administration courses, and the basic course in economic principles will constitute approximately 50 per cent of the total academic program.

The technical education described above, combined with a balanced education in the arts and sciences, should provide a graduate of a four-year program in business with the educational background necessary for him to serve as a professional staff member of the General Accounting Office and to develop into a highly competent professional person.

The supply of accounting trained graduates is already inadequate, in spite of the excellent opportunities and attractive income potential. Failure to increase the number of graduates with the modest accounting specialization indicated above would severely hinder the General Accounting Office in obtaining the personnel necessary to carry out its responsibility of auditing and appraising the management of activities involving the expenditures of over 80 billion dollars per year.

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TOWARDS EDUCATIONAL POTENCY

There are some colleges . . . which . . . see their mission in terms of developing the full range of their students' capacities—moral and social as well as intellectual. Some startling things happen at such places. Often students, faculty, and administration knit together a "community of values" out of which grows a breed of college graduate committed to the service of his society.

Among the factors at work in these potent institutions, I believe we can identify, first, the level, clarity, and character of the institution's expectations, the model with which the freshman is confronted when he comes to college and towards which he is encouraged to move during college.

Second, the disposition of the faculty in these influential colleges is humanistically oriented towards the students and sympathetic to a concept of the academic profession which includes a normative role.

Third, the organization of the educational endeavor engages student responsibility, providing adequate opportunity for individual responsibility in the pursuit of an education, and, in addition, providing adequate opportunity for collective responsibility by the students in both educational and social decisions.

Fourth, potent educational programs seem centered on engaging the student in important value-laden experiences tailored to his individual needs and personal capacities.

. . . Philip E. Jacob in Education for Social Responsibility, a pamphlet published by the American National Red Cross.

Inside Government

ROBERT B. LEWIS, *Editor-In-Charge*

NATIONAL AERONAUTICS AND SPACE AGENCY

A department dealing with current developments in all fields of financial management in the Federal Government, covering the more significant programming, budgeting, accounting, financial reporting and auditing activities in the central fiscal and operating agencies.

* * * * *

Senate Study Urges Broader Powers for Budget Bureau

In a study submitted October 16, 1961, to the Senate Committee on Government Operations, its Subcommittee on National Policy Machinery headed by Senator Henry M. Jackson, Democrat of Washington recommended:

- Broader powers for the Bureau of the Budget.
- Simplifying the budget document to enhance the contributions which the budget process can make to planning and executive management.
- Extending the budgetary time horizon and incorporating longer-term projections of requirements, economic activity and tax revenue.
- Providing through the budget data more useful in illuminating program choices and measuring program performance.

Senator Jackson pointed out in his foreword to the study that the Federal budget is now more than 30 times what it was in 1921 when the Budget and Accounting Act created the first national budget system and brought into being the Bureau of the Budget. The study highlights the need for making sure that the Bureau of the Budget and the Government's use of the budgetary process keep pace with the spiraling complexity of foreign and defense policy, toward the end of giving the President and the Congress maximum assistance in a world of Berlin and the ballistic missile.

Observing that the Budget Bureau will never win a bureaucratic popularity

ADVISORY AND CONTRIBUTING EDITORS

William J. Armstrong, Bureau of the Budget
Edmond J. Rouhana, General Services Administration
Simmons B. Savage, Jr., General Accounting Office
George F. Stickney, Treasury

contest, the report pointed out that it must often be a "no-sayer" and help the Chief Executive trim agency programs to fit the Presidential cloth—hence its reputation, even if undeserved, as the "villain" of the Executive Branch. It can be employed, according to the report, primarily to keep a lid on expenditures or much more significantly as a "lengthened shadow" of the President across the whole front of fiscal policy and program management. The latter role is advocated by the study in these words:

> "Employed with sophistication, the budgetary process can . . . be the President's most discriminating and effective tool in controlling the Executive Branch. It reaches deep into the activities of the great departments; it is the one Presidential management device common to all of them; it works on that most sensitive pressure point—the pocketbook nerve."

The study further comments that the Budget Bureau is uniquely equipped to serve the President well. The Bureau's permanent professional staff of almost 300 members, it states, dwarfs any other found at the Presidential level and is seasoned and outstandingly stable. It also recommends that

> "The Bureau should preserve an arm's length relationship with the departments and agencies. In working with agency program and budgetary officers, the danger is always present that Bureau members may themselves become committed to particular agency budgets, and end as departmental protagonists. The Bureau members must remain the President's men."

Concerning the budget document itself, the report states that the time is at hand for a determined effort to make it shorter, simpler, and easier to read and understand. It then proceeds to point out that the main problem goes deeper and that the job of making the budgetary process a more versatile and useful tool of the President badly needs doing. Two problems, it states, rank highest: How to make the budget more helpful in forward planning. And how to make it more useful in illuminating program choices and measuring program performance. It concludes with the statement that the Bureau of the Budget, working with the departments and agencies, ought to take the lead in developing better ways of measuring performance.

1962 *Budget Deficit Forecast*

All three bases of presenting Federal receipts and expenditures are now expected to reflect deficits for fiscal year 1962, according to the 1962 Budget Review released by the Bureau of the Budget on October 30, 1961.

(In billions of dollars)

	Receipts	*Expenditures*	*Deficit*
Administrative budget	$82.1	$89.0	$6.9
Consolidated cash budget	102.7	111.1	8.4
Federal expenditures and receipts in the national accounts	105.2	105.4	.2

The administrative budget is the oldest statement of receipts and expenditures and is the set of figures generally reported in the press. When "the" deficit or surplus is printed in the newspapers, it is ordinarily the deficit or surplus in the administrative budget. The system of accounts reflected in this statement has been developed over the years primarily for purposes of program management and control. The administrative budget contains the accounts

which the Congress reviews annually as part of the appropriations process.

The administrative budget includes at the present time only about four-fifths of the total receipts and payments of the Government. It omits the receipts and expenditures of the trust funds, which is a sizeable omission—about $25 billions in the present fiscal year. About half of the omitted $25 billions relate to the old age and survivors insurance trust funds; other large sums are for the unemployment and the highway trust funds. These trust account items are the main reason for the difference between the $89 billions of Federal expenditures shown in the administrative budget and the 111 billions of Federal payments shown in the consolidated cash budget.

It was to include in one set of figures all the transactions affecting the flow of money between the Federal Government and the public that the consolidated cash budget was invented fifteen or twenty years ago. The trust funds are omitted from the administrative budget on the grounds that these funds are fiduciary accounts comparable to private insurance or pension funds; the revenues are held in trust and payments from the fund are not costs of Government in the normal budget sense, except for the highway trust fund. Most economists believe that the consolidated cash budget provides a better set of figures for purposes of economic analysis than does the administrative budget.

Also useful for economic analysis are the figures for Federal receipts and expenditures developed by the Department of Commerce in terms consistent with the national income accounts. These figures are especially designed to show the effect of Federal activities on current incomes and production in the Nation. Like the consolidated cash figures, the national income account figures are comprehensive and include the trust accounts. There are, however, two major and very significant differences between the two.

The first is that the national income account figures are designed to show accrued receipts and expenditures, not cash income and outflow. The improvement is especially important with respect to corporation taxes, collections of which lag some six months or so behind their accrual. Tax accruals therefore show a very different time sequence from tax collections, and this is often important—as it is right now—in understanding what is actually happening to the budget.

The second major difference is that the national income accounts figures, unlike the consolidated cash figures, exclude balance sheet transactions—purchases and sales of assets, loans made by Federal agencies, and so forth. Such transactions shift the ownership of assets, but are not part of the current flow of production and incomes.

These two differences are the principal explanation of the gap between the $8.4 billions consolidated cash deficit and the $.2 billion Federal deficit in the national income accounts estimated for fiscal 1962. Tax accruals in this fiscal year are expected to be about $3 billions higher than tax collections. And balance sheet transactions, principally net loans by the Small Business Administration, the Veterans Administration and other Federal agencies, are expected to be about $5 billions.

Budget Director Bell reports that when the budget figures, in national income terms, are calculated on a quarter-by-quarter basis rather than in terms of an annual total, the rate of deficit is falling steadily and early in the calendar year 1962 the quarterly rate is expected to turn from deficit to small surplus. This means that the present outlook, as measured by the national income figures, is for the Federal budget by early next year to be exercising not a net stimulative but a net restraining influence on the economy.

New Report on the Joint Financial Management Improvement Program Being Distributed

The new 1961 edition of the Annual Report of the Joint Financial Management Improvement Program is scheduled for distribution this month. Always a best seller, this report describes the accomplishments during the year and the plans for future improvement work. The report this year is somewhat more concise than its recent predecessors and features a selection from the data submitted by executive agencies in response to Bureau of the Budget Bulletin No. 61-11 of April, 1961. Another departure from previous editions is the arrangement of agency data by function rather than by agency. The 1961 report's primary objective is to present a concise and meaningful summary of the more significant accomplishments, management benefits and plans in the financial management field.

Bulletin No. 61-11 called for information from each executive agency on the status of its financial management improvement program as of June, 1961, its accomplishments during fiscal year 1961, and its plans for future improvement activity. Agency reports were due last June 30, in an original and four copies, two of which were distributed to the General Accounting Office and the Treasury Department. The three central agencies used these reports to jointly consider the results and status of the organized program being conducted in each executive agency under the provisions of Bureau of the Budget Bulletin No. 57-5. They also jointly selected from them the items which appear in the Joint Financial Management Improvement Program Annual Report for Fiscal Year 1961, now being distributed.

Management Clearing House File

In May 1961 Bureau of the Budget Circular No. A-53 announced the establishment of a Management Clearing House File as a special addition to the Bureau of the Budget Library. The Management Clearing House File contains a collection of agency materials that is intended to help agencies benefit from each other's efforts to develop better management methods. It thus meets the oft-expressed need for a central interchange of noteworthy management materials.

This collection brings together agency materials on specific management systems, techniques, practices and problem solutions that may be of interest to other agencies. The initial collection numbers over 400 items gathered by the Bureau of the Budget and is being supplemented by further agency contributions. The scope of the collection covers the entire management field and includes a section on financial management. An attachment to Circular No. A-53 gives the initial subject listing of the Management Clearing House File. Materials in the Management Clearing House File are available to agency personnel for review and loan through regular interlibrary loan arrangements.

1963 Budget Instructions

In its reissued Circular No. A-11 released last August, the Bureau of the Budget provided instructions to agencies for the preparation and submission of their annual budget estimates for fiscal year 1963. Among the major changes this year were new policy statements with respect to:

- Construction estimates for nuclear research or test reactors.
- Rental costs for additional space required for new or expanded programs.
- Payments to the Employees Compensation Fund.

Some of the budget schedules were simplified and a number of changes were made for clarification and consistency in the budget document. As in previous years, all sections of the Circular were reprinted, whether or not a change was made, so that previous issuances might be destroyed.

Weapon-Systems Costing in Defense

Military departments within the Department of Defense submitted their fiscal year 1963 budget and program estimates in terms of weapon systems and mission activities, and the Secretary of Defense made his program decisions on this basis. Decisions on competitive weapon systems involved estimating and comparing both the costs and capabilities of the alternative proposals. This new department-wide approach to decision-making reflects the strong emphasis key officials in the Department place on financial management data.

Under this approach two principal types of financial planning are distinguished. The longer-term financial planning is in terms of total costs of development, production and operation of individual weapon systems for their total lives, ranging from five to ten years. The shorter-term financial planning is the annual budget, which may be considered to be mere segments of long-term financial plans.

The existing accounting structure in Defense is not designed to validate and refine cost estimates on a weapon-system and mission basis. It primarily serves to account for the use of funds in the manner in which they were appropriated and to provide cost data for middle and lower management. The additional financial management data needed for mission and weapon-systems management and decision-making is being planned largely as an "add-on" to the exisiting system. In lieu of abandoning present appropriation categories, the intention is to supplement them with mission and weapon-systems data that are regarded as more meaningful for top-level decision-making purposes. An intermixing of data produced by accounting means with data produced by other means is being planned in forms which can be projected and manipulated statistically into the various courses of action and alternatives possible.

Federal Supply System

Legislation enacted the last session of Congress, Public Law 87-372, removes the $150 million limitation on capital of the General Supply Fund. Other legislation still pending would, if enacted, result in a change of catalog prices to a "delivered price" basis for items in General Services Administration's supply distribution system. This pending legislation passed the House as H. R. 8100 (see House Report No. 1218) and carries over into the second session of the 87th Congress.

In another development the Department of Defense has issued its operating manual for the new single line-item requisitioning procedure (MILSTRIP). The General Services Administration is now gearing up its data processing activities to handle single-line requisitions effective July 1, 1962. It is also studying the advisability of expanding this technique to the civil agencies of the Federal Government. In the meantime both single-line and multi-line requisitions are being accepted.

Defense Supply Agency

All inventories to be managed by the newly-established Defense Supply Agency will be financed under a Department of Defense stock fund. The Agency will also have appropriations for administrative costs, construction, and research and development activities. Once the Agency becomes operational, one of its first major decisions will have to be whether or not to include missile and aircraft spares under the new stock fund.

Revaluation of Government-Owned Real Property

The heads of all Federal real-property holding agencies were requested recently by the General Services Administrator to review and comment on a draft of guidelines the Department of Interior proposes to follow in conducting a pilot study to determine estimated current-day values of its real property. These guidelines were developed by Interior with the assistance of the General Services Administration in response to a request from Congressman Dawson, Chairman of the House Committee on Government Operations. The Committee's staff is collaborating with representatives of the Bureau of the Budget, the General Services Administration and the Department of the Interior in conducting the pilot study for the establishment of current-day values for Interior's real property. A broad formula approach is planned and the study will be limited to Interior's real property in the States of Washington, Oregon and Idaho. On the basis of this study a determination will be made as to whether the undertaking should be extended to other Federal agencies. The time and cost of the task are to be weighed against the usefulness of the revaluation data produced.

General Accounting Office Manual Revisions

Four recent manual revisions were released by the General Accounting Office, one affecting Title 6 (Payroll, Leave and Allowances) and three affecting Title 7 (Standardized Fiscal Procedures). The Title 6 revision provides for payments by departments and agencies of amounts due deceased civilian employees of the Government (including deceased former employees who die after separation from the employing agency) without prior settlement by the General Accounting Office unless adjudication is required. The Title 7 revisions simplify fiscal procedures, principally by:

- Eliminating the provision that unobligated amounts of indefinite current year appropriations be recorded as deappropriations to the limitation amount originally recorded in the account as the new obligational authority.
- Streamlining the processing of Treasury Department Standard Form 224, Statement of Transactions, prepared by civilian agencies for which the Treasury Department disburses.
- Standardizing reporting procedures for all disbursing and other accountable officers regardless of whether they operate with a funded or unfunded checking account.
- Extending the provisions for the preparation of consolidated reports for Treasury central accounting purposes to include the Justice Department (U.S. Marshals) and the U.S. Courts (Marshals and Clerks of the U.S. Courts).
- Permitting preparation of Standard Form 1220, Statement of Transactions According to Appropriations, Funds and Receipt Accounts, in whatever columnar classification best fits the internal needs of the agency's accounting system, so that repayment and disbursement transactions now may be reported on either a net or gross basis.

In addition, the special exclusion of the Post Office Department from the provisions of Chapter 7000 has been cancelled, thereby requiring Post Office disbursing officers to prepare statements of accountability and statements of transactions for audit and settlement by the General Accounting Office.

Interagency Training Expanded

The Fall 1961 Interagency Training Bulletin lists some 200 different courses, more than ever before offered. Among the more than 40 new courses are Applications of ADP to Personnel Management, ADP in Supply Activities, ADP in Financial Management, Budget Preparation and Presentation, a Senior Seminar in Operations Research, a four-day Financial Management Conference, Financial Management for Executives, an Institute and Intern Program in Personnel Management, and several courses concerned with training aids and methods. This comprehensive program of interagency training reflects the strong emphasis placed on effective management throughout the Federal Government and is prima facie evidence of the many opportunities available for career development.

General Services Administration Training Program

Since 1957 the General Services Administration's Comptroller has had in effect a Financial Management Training Agreement covering a 30-month training program with a standard promotion pattern from grades GS-5 to GS-11 and accelerated promotion from GS-5 to GS-7 in six months. This training program is comprised of on-the-job rotation assignments to the different organizational components in the Office of Comptroller for the purpose of covering all aspects of financial management in the General Services Administration. The program was evolved in cooperation with The George Washington University and trainees receive Graduate Intern Scholarships in the University's School of Government, Business, and International Affairs. A similar training agreement covering regional financial management operations has been worked out with the Civil Service Commission and coverage has now been extended to all regional offices of the General Services Administration.

Two specialized training programs in the area of automatic data processing are of particular interest:

- A nationwide program to provide qualifying training and experience to enable employees to enter digital computer occupations series.
- A 30-month program (for the Metropolitan Washington area) developed along the lines of the Financial Management Training Agreement but with rotation assignments within the digital computer occupation areas only.

Abolished Government Corporation "Profitable"

When President Kennedy signed the bill to abolish the Federal Farm Mortgage Corporation in October, the final chapter, according to Governor R. B. Tootell of the Farm Credit Administration, was written in the record of a Government institution that saved hundreds of thousands of farms from foreclosure during the 1930's. Governor Tootell explains that the Federal Farm Mortgage Corporation stepped in during the depths of the Depression and provided loan funds by selling Government-guaranteed bonds to make its high-risk Land Bank Commissioner loans. The making of these loans was handled by the already-established cooperative Federal Land Bank System, but loan operations were never merged with the permanent activities of the Land Bank System. The Corporation has made no new loans since 1947 and its remaining loans and contracts were sold to the respective Federal Land Banks in 1955. During the Corporation's life, losses materialized on many loans but net earnings enabled the Corporation to absorb them. As a result, the Corporation not only was able to repay the original $200 millions of Government capital, but paid $146 millions in dividends to the Government and is now turning over to the U.S. Treasury its remaining assets valued at about $1.6 millions.

Policies Governing Acquisition of ADP Equipment

Bureau of the Budget Circular No. A-54 issued October 18, 1961, provides instructions for all executive agencies on policies to be observed in the selection and acquisition of automatic data processing (ADP) equipment. These policies require equal opportunity and appropriate consideration to all manufacturers of equipment which meets system specifications. The selection of equipment is not to be made until system specifications are available, and the system specifications are to be designed to insure free competition among equipment manufacturers. Capability to fulfill system specifications and overall costs are prime factors to be considered in the selection of equipment. When equipment of two or more manufacturers meets system specifications, the equipment which represents the least overall cost to the Government is to be selected.

Guidelines prescribed for use in determing whether ADP equipment should be purchased, leased with an option to purchase, or simply leased, are:

1. The purchase method is to be used when the system study, which preceded the selection of the equipment, has established a reasonable expectancy that the equipment under consideration can be successfully and advantageously used; when a comparative cost analysis of alternative methods of acquisition indicates that a cost advantage can be obtained by the purchase method in six years or less after the date of delivery; and when the capabilities of the ADP equipment will continue to be needed and will be sufficient to satisfy the current and projected system requirements for a period beyond the time at which the purchase method begins to provide cost advantage.

2. The lease-with-option-to-purchase method is indicated when it is necessary or advantageous to acquire equipment that meets system specifications, but it is desirable to defer temporarily a decision on purchase because circumstances do not fully satisfy the conditions which would indicate purchase. This situation might arise when a short period of operational experience is desirable to prove the validity of a system design on which there is no previous experience, or where decisions which might substantially alter the system specifications are imminent.

3. The lease method, without option to purchase, is indicated only when it is necessary or advantageous to acquire equipment that meets system specifications and it has been established conclusively that any one of the conditions under which purchase is indicated is not attainable.

It is anticipated that the effect of the purchase policies prescribed in these instructions will be to increase equipment acquisition costs in the short run but to save much larger sums in the long run. The instructions also reemphasize the need for analytical studies as a precedent to decisions on the selection and acquisition of ADP equipment, as well as readiness reviews prior to acceptance, and require adequate documentation of studies, reviews and decisions.

New Computer Installations Planned for Disbursing Offices

New computer installations being established at the Treasury's Philadelphia and Kansas City Regional Disbursing Offices are scheduled to be operational by January, 1962. The Philadelphia installation, consisting of three IBM-1401 computers with peripheral equipment, will process annually about 100 million checks for recurring benefit payments, salary payments and income-tax refund payments. The Kansas City installation, consisting of one IBM computer and peripheral equipment, will have an annual workload of some 30 million checks. Plans are also in process for computer installations in the San Francisco and Birmingham Regional Offices later in 1962. The initial disburs-

ing installation was the one at Chicago described in Mr. Mock's article, Paying Five Million Veterans, which appears in this issue of THE FEDERAL ACCOUNTANT. The Chicago installation is based on an IBM-7070 computer and has been operating successfully since January, 1961.

The two newest installations are being staffed by employees of the Bureau of Accounts who were trained in programming and console operations. Programs for these installations were developed by 26 trainees who are being transferred to the new installations to refine the programs prior to the delivery of the computers. The programs were first tested in Washington, D.C., on area IBM-1401 systems.

Internal Revenue Computer Center Dedicated

Formal dedication of the new Internal Revenue Service National Computer Center was held at the site, Martinsburg, West Virginia on Monday, November 6, 1961, with Treasury Secretary Dillon in attendance as the principal speaker. The National Computer Center will be the heart of the Service's automation system for processing income tax returns. The installation is in a new building constructed for the Internal Revenue Service on grounds adjoining the Veterans Administration Center at Martinsburg. Equipment is in place, staffing is in progress and preliminary operations have been instituted preparatory for actual processing next year of data from seven southeastern states of the Revenue Service's Atlanta Region: North and South Carolina, Georgia, Tennessee, Alabama, Mississippi, and Florida. Other Regions will be brought into the system in subsequent years.

It is at the National Computer Center that master files of taxpayer accounts will be maintained on magnetic tapes, ultimately for the entire country. Data from tax returns will be transcribed on tapes at a series of Regional Service Centers and then flow to the National Center for processing against the master file, from which will come "action" tapes for issuance of refund schedules, bills, etc. Taxpayers will continue to file their returns with their District Directors and receive necessary services from these offices.

Civil Agency Telecommunications System

General Services Administration has recently been assigned responsibility for maintaining and operating a nationwide Federal Telecommunications System for civil agencies of the Government. It is estimated that sales and services to civil agencies will approximate $100 million a year. To simplify cost distribution methods, the entire system will be financed under a revolving fund, and to the greatest extent possible, the cost of services rendered will be recovered on a flat-rate basis. Accounts will be maintained within the revolving fund to identify the cost of services and related revenues, for the purpose of establishing and adjusting applicable billing rates. The system is expected to be fully operational by 1966.

Motor Vehicle Operational Cost Study

Under the auspices of the Steering Committee of the Joint Financial Management Improvement Program, the General Services Administration is spearheading a project to determine what improvements can be made in recording and reporting motor vehicle operational costs and related data. Lack of consistency in recording and reporting motor vehicle operational data has hampered the preparation of reports for management and budget purposes and on a number of occasions has been the subject of congressional criticism. The pro-

ject team proposes to visit various executive agencies at departmental and field level to review motor vehicle recording, accounting and reporting practices. On the basis of these reviews and discussions with agency personnel, recommendations will be developed for more effective management of the Federal fleet and for compilation of Government-wide data on a consistent basis.

Additional information on matters appearing in this department may be obtained from the Federal Financial Management Information Center established by the Association in cooperation with The George Washington University. Requests for information should be addressed to Professor Edwin J. B. Lewis, Director, Federal Financial Management Information Center, School of Government, Business, and International Affairs, The George Washington University, Washington 6, D. C.

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Government and Industry

NORMAN L. BURTON, *Editor-In-Charge*
ARMY AUDIT AGENCY

A department dealing with current developments in that vital segment of our national economy that interrelates the Federal Government and industry, for better or for worse, to an ever increasing extent.

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According to a widespread belief, business and government in the United States are mutually independent. The fallacy of this conception is readily apparent merely upon reference to the taxes paid by business organizations and to the products and services they sell to government agencies.

The framers of the Constitution of the United States did not anticipate how their words might be interpreted generations after they were written, and they certainly did not visualize many of the situations that have given rise to judgments and decisions based on its broad language. Under Article I, Section 8 of the Constitution, Congress is empowered ". . . to provide for . . . [the] . . . general welfare of the United States" and "to regulate commerce with foreign nations, and among the several states . . ."

Through the use of "protective" tariffs during much of the nineteenth and the twentieth centuries the Federal Government assisted industry to become established. It made substantial grants of land to encourage the development of the railroads. Shipping and aviation, in their construction and operation aspects, received essential support from the Government, based originally on defense requirements. Similarly, Government and industry have shared the responsibility for the development of electronic equipment and devices, with resultant benefits to both; and for atomic energy, in the development of

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which as a commercial product industry is now experimenting. For several years the Federal and state governments have combined with the engineering and construction industries in the creation, throughout the country, of a system of super-highways that will be second to none.

Nor is the end in sight. Government and industry are interdependent, rather than mutually independent.

The growth of some organizations to positions of dominance in their industries, the recognition of monopolistic characteristics in others, and the accumulation of undesirable practices in others, led both Federal and state governments to enact regulatory legislation to curb or discourage the development of predatory or avaricious tendencies in individual companies and to assist industries to establish sound standards as a basis of operation. Relying on the Constitutional provision authorizing Congress to regulate commerce among the states, the Interstate Commerce Commission was created as an independent establishment by the Act to Regulate Commerce, of February 24, 1887 (24 Stat. 379, 383; 49 U.S.C. 1-22). It is concerned with the problems of common carriers in interstate overland and water transportation. Originally its jurisdiction was over railroads only, but with the growth of other forms of transportation it was extended to pipe lines and to motor vehicles for hire.

In 1915 the Federal Trade Commission was organized pursuant to the Federal Trade Commission Act of 1914 (38 Stat. 717; 15 U.S.C. 41-51) to prevent unfair methods of competition and unfair or deceptive acts or practices.

In 1920 a cabinet-committee forerunner of the present Federal Power Commission was created by the Federal Water Power Act (41 Stat. 1063; 16 U.S.C. 791-823) to license hydroelectric projects on Government lands or navigable waters of the United States. Ten years later the Federal Power Commission, consisting of five commissioners instead of three cabinet members (Secretaries of War, Agriculture and Interior), was established as an independent agency. Over the years the scope of its responsibilities has been substantially broadened to cover the regulation of interstate electric operations and the production and interstate transportation of natural gas.

The year 1934 witnessed the establishment of the Securities and Exchange Commission, created under authority of the Securities Exchange Act of 1934, (48 Stat. 881; 15 U.S.C. 78a to 78jj) to administer the Securities Act of 1933, initially administered by the Federal Trade Commission. In the more than quarter-century of its activity, its responsibilities have been augmented through the provisions of many acts, all to enable the Commission to carry out its general objective of protecting the interests of investors and the public against malpractices in the securities and financial markets.

The Communications Act of 1934 created the Federal Communications Commission (48 Stat. 1064; 15 U.S.C. 21; 47 U.S.C. 35, 151-609) "for the purpose of regulating interstate and foreign commerce in communication by wire and radio . . .", thus centralizing jurisdiction over communications that had previously resided in the Federal Radio Commission (created in 1927, absorbing the Radio Division of the Department of Commerce which had existed since 1910), the Interstate Commerce Commission and the Post Office Department.

The Civil Aeronautics Act of 1938 (52 Stat. 973; 49 U.S.C. 401) initiated Federal consideration of the problems of the transportation aspects of aviation. The responsibilities established under this act were separated two years later and divided between the Civil Aeronautics Administration, which was identified with the Department of Commerce, and the Civil Aeronautics Board, an independent agency. In repealing the Civil Aeronautics Act of 1938, the Federal Aviation Act of 1958 continued the Civil Aeronautics Board with three primary functions: (1) regulation of the economic aspects of domestic and international United States air carrier

operations and of the common carrier operations of foreign air carriers to and from the United States; (2) participation in the establishment and development of international air transportation; and (3) promotion of safety in civil aviation.

Most recent of the agencies created to perform regulatory functions is the Federal Maritime Commission, established on August 12, 1961, by Reorganization Plan No. 7 of 1961, H.R. Doc. 187, 87th Session, the latest in a series of organization readjustments affecting Federal activities in non-naval maritime matters, which had their origin in the United States Shipping Board, created on September 7, 1916 (39 Stat. 729). The functions of this Board and related organizations were transferred to the Department of Commerce by Executive Order 6166 of June 10, 1933, (on October 26, 1936) and subsequently were assumed by the United States Maritime Commission, created by the Merchant Marine Act of 1936, (49 Stat. 1985; 46 U.S.C. 1101 etc) whose purpose it was "to further the development and 'maintenance of an adequate and well-balanced American merchant marine, to promote the commerce of the United States, to aid in the national defense . . .". The United States Maritime Commission was abolished by Reorganization Plan No. 21 of 1950, effective May 24, 1950, and its functions and those of its chairman were transferred to the Federal Maritime Board in the Department of Commerce and to the Secretary of Commerce, who delegated his authority to the Maritime Administrator. Under Reorganization Plan No. 7 of 1961, promotional and other non-regulatory functions of the Federal Maritime Board and the Maritime Administrator are retained in the Maritime Administration, still a primary organization unit in the Department of Commerce.

Federal efforts to protect the public from excessive rates for service, from unethical and improper practices, from inattention to safety measures, from unsound economic procedures, and from other activities of industry that mitigate against the welfare of the nation and its citizens, are not limited to the six or seven "regulatory" agencies. Many others perform comparable functions within the scope of the much broader missions with which they are charged.

The interdependence of government and industry places on both obligations and opportunities in the areas of accounting, auditing, budgeting and other phases of financial administration. THE FEDERAL ACCOUNTANT will welcome contributions that deal with various features of the interdependence—whether they emphasize the points of view, procedures and problems of industry, are concerned with activities of government, or attempt to reconcile differences of opinion that have arisen in connection with the interrelations of government and industry.

Through this department The Federal Accountant will inform its readers of current financial management developments in this vital segment of our national economy that ever increasingly interrelates government and industry.

NEW SERVICE COMPANY PROPOSED FOR SPACE SATELLITES

Organization of a novel public-utility-type service company to serve public utilities exclusively was proposed on October 12, 1961, to the Federal Communications Commission by a group of nine telephone and telegraph companies, which had previously been given special authorization to confer for the purpose of devising a program of joint action even though they are in competition with each other.

The proposed service company would represent the United States in the management and operation of a system of communications satellites in which all nations of the world would have the opportunity to share. These satellites are space vehicles carrying radio receivers and transmitters to relay onward automatically the communications received. If they operate at about 6,000 miles above the earth, the system may comprise twenty satellites; if a 22,000-miles-above-the-earth operation proves

feasible, three pairs of satellites may do the job. Capital costs are obviously difficult to forecast in such a new operation but they are seen as falling in the range of $50 to $150 millions, with the related ground radio stations accounting for possibly another $50 millions.

Communications satellite development and operation will present the Federal Communications Commission with many perplexing accounting and rate-making problems. The satellite system initially will have a large excess capacity and therefore will pose a challenging problem in rate-making. Should the carrying costs of the total capacity, including that recognized to be excess, be assessed against the users currently, be borne by stockholders, or be deferred for absorption by users in the future when capacity is likely to be much more fully utilized? Public utility depreciation expense concepts may have to be altered to fit the fact that it will be impossible to predict accurately the service lives of expensive satellites. The satellites presumably will be too few in number to permit the law of averages to operate as in mass utility properties. Developmental costs on the other hand will be substantial. Should these be expensed currently, be considered as a part of the cost of the initial system of satellites, or be treated as an intangible asset to be written off over an extended period? All such questions, and many others as well, will have to be worked out while government and industry are giving their utmost in effort to put a satellite system into commercial operation sufficiently ahead of others to demonstrate the superiority of the free enterprise system.

ACCOUNTING SYSTEMS PRESCRIBED BY INTERSTATE COMMERCE COMMISSION

Operating revenues of the 4,816 carriers now coming under accounting regulations prescribed by the Interstate Commerce Commission reached a record high of $19.53 billions in 1960. More than 75 per cent of these companies are motor carriers, according to the following breakdown of reporting companies classified by the eleven systems of accounts prescribed by the Commission:

Motor Carriers	3,667
Railroads	778
Water Carriers	136
Oil Pipelines	86
Freight Forwarders	61
Stockyard Companies	42
Electric Lines	32
Refrigerator Car Lines	7
Holding Companies	4
Express Companies	2
Sleeping Car Company	1
Total	4,816

Periodic reports are also received from 14,787 other companies for which accounting regulations have not been prescribed:

Car Lines (companies furnishing cars for use on railroads)	105
Class II and Class III Motor Carriers of Passengers	1,000
Class III Motor Carriers of Property	13,450
Water Carriers	112
Freight Forwarders	27
Holding Companies (motor)	28
Street Electric Lines	7
Rate Bureaus and Organizations	58
Total	14,787

NEW UNIFORM SYSTEM OF ACCOUNTS FOR RAILROADS PENDING

The Interstate Commerce Commission recently released a proposed revision to the uniform system of accounts for railroads eliminating the controversial acquisition adjustment account. The proposed new procedures for accounting for the acquisitions of railway property correspond in theory to those recommended by the American Institute of Certified Public Accountants in its Accounting Research Bulletin No. 48, Business Combinations, issued in Janu-

ary of 1957. The scheduled effective date for the revised system is January 1, 1962.

STUDY OF FREIGHT CAR RENTALS

The Cost Finding Section of the Interstate Commerce Commission's Bureau of Accounts has undertaken a comprehensive study of the per diem charges for freight car rentals among carriers. This study is being made to ascertain the reasonableness of car rental charges and it will include analyses of the costs, maintenance, depreciation and taxes on original and reproduction bases for all freight cars in use.

DESTRUCTION OF RECORDS FOR PIPE LINE COMPANIES

New Interstate Commerce Commission instructions relative to the destruction of records for pipe line companies reduce the retention period for many records. They also reflect a general recognition of technical advances in the area of microfilming and the resultant wide acceptance by the courts of microfilm evidence.

FEDERAL POWER COMMISSION SUBSTANTIALLY CURRENT IN DISPOSING OF CASES

Federal Power Commission Chairman Kuykendall reported recently that the members of the Commission are now current in disposing of cases which have reached the decision stage. The Chairman said that, except for a very few cases which have come before the Commission only recently, the backlog of proceedings awaiting decision has been eliminated. He pointed out that most of the proceedings which make up the high statistical totals of pending cases are still in various stages of staff processing, in hearing, or awaiting examiners' decisions. In addition to formal case opinions and important orders, the Commission also issues numerous routine orders each week disposing of noncontested gas and electric cases.

COORDINATED BANK EXAMINATION PROCEDURES

Because of the increasing use of automatic data processing equipment by commercial banks, the three Federal bank supervisory agencies (Federal Reserve, Federal Deposit Insurance Corporation and Comptroller of the Currency) are cooperating to refine examining procedures where such equipment is in use. An interagency committee, with membership from each of the three supervisory agencies, has been established to develop more effective examination procedures for automated banks.

CONGRESSIONAL SUBCOMMITTEE TO REVIEW STATE TAXES ON INTERSTATE BUSINESS

The Special House Subcommittee on State Taxation of Interstate Commerce will open hearings December 4, 1961, on state taxes levied on companies that do business in several states. The subcommittee's primary concern is the extent to which a company that does business in several states is taxed in each of them on business income. After the income tax hearings, the subcommittee expects to go into other forms of state and local taxes, perhaps sales and use taxes. The general object is to see whether Federal legislation is justified. Specifically the subcommittee wants to find out:

- How much it is costing business in the way of red tape and extra expense to keep up with the numerous state and local income taxes.
- Whether there is a real possibility that, when all state and local taxes are counted up, an interstate business can be taxed on more than 100 per cent of its income.
- Whether Public Law 86-272 passed in 1959 to eliminate some state and local taxes on interstate businesses goes far enough. This law protects businesses which do no more than solicit orders within a taxing state.
- Whether states should be permitted to tax some businesses now

exempt under the law. Specifically, businesses selling more than $100,000 a year in a particular taxing state are mentioned.

GUIDELINES FOR ESTIMATING SALES TAX DEDUCTIONS

The Internal Revenue Service is again providing guidelines for taxpayers residing in states with general sales tax laws for estimating sales tax deductions for 1961. These guidelines will take the form of sales tax tables which show average amounts spent by residents for sales taxes. They are intended to serve as guides for taxpayers who itemize deductions on their Federal income tax return, Form 1040. The sales tax tables will be available in the respective district offices on or about December 6, 1961.

NEW COMMERCE INFORMATION CENTER

The Department of Commerce has established a new Information Center in its main lobby in order to remove the last semblance of difficulty for businessmen who need a path-finding service in the nation's capital. In this connection Assistant Commerce Secretary Burnstan recently expressed surprise at the number of businessmen who bypass the Department of Commerce in seeking help with their foreign trade problems, probably for one or both of the following reasons:

- Businessmen who have learned of specific services by other agencies go there instead of going to Commerce
- The Government is so complex and there are so many agencies dealing in matters of foreign policy many businessmen do not know where to go.

Among the many agencies in the Federal Government concerned with foreign trade matters are the State, Treasury, Agriculture and Labor Departments, the Agency for International Development, the Export-Import Bank and the Tariff Commission. The Secretary suggested that anyone "lost" in Washington has all the more reason for coming to the Department of Commerce and taking advantage of its one-stop service. The Commerce Department, he states, can not only provide much of what is sought but will steer businessmen precisely to and even make appointments with appropriate individuals in other agencies.

Additional information on matters appearing in this department may be obtained from the Federal Financial Management Information Center established by the Association in cooperation with The George Washington University. Requests for information should be addressed to Professor Edwin J. B. Lewis, Director, Federal Financial Management Information Center, School of Government, Business, and International Affairs, The George Washington University, Washington 6, D. C.

Professional Reading

JACK ZWICK, *Editor-In-Charge*

HARVARD UNIVERSITY

ARTICLES

Carson, John J. "More Government in Business," *Harvard Business Review*, 39 (May-June 1961), 81-88.

In an article that explores how the Federal Government has grown and changed during the 1950's, Mr. John J. Carson of McKinsey and Company, Inc. predicts the following changes in Federal activities over the course of the next few years:

- More goods and services to be bought by Government
- Government support for science to be increased and extended
- Government to continue to expand as an entrepreneur
- Business activity to be more closely regulated by Government
- Government to continue to promote major industries
- Business to receive more government encouragement to invest abroad
- Government to persist in its protection of the underdog
- Government to steadily promote economic stability and growth.

Among the interesting data provided by Mr. Carson in this article is the fact that purchases by Federal, state and local governments accounted in 1960 for 20 per cent of the Gross National Product versus 13 per cent in 1950. National defense procurement represented about one-half of the total of $100 billions in government purchases in 1960. In 1959 eleven of the country's 100 largest Corporations sold over three-fourths of their total output to the Federal Government and dozens of them depend upon this one customer. Government procurement has become such an important phase of the national economy that entire industries often are affected by the placement of major contracts. Mr. Carson also pointed out that the Federal Government now contracts for many services formerly performed by its own staffs.

Mr. Carson predicts that in the next few years government expenditures for defense, highways, airports, schools and space exploration will reflect significant increases. By 1965, he expects Federal procurement expenditures will exceed $70 billions and procurement expenditures by all levels of government will exceed $110 or $112 billions.

Heyman, Victor K. "Government by Contract: Boon or Boner?", *Public Administration Review*, 21 (Spring 1961), 59-64.

Increased contracting for types of services formerly performed by Federal staffs raises many new problems that need to be resolved. According to Mr. Heyman, very little is known about administering the large numbers of personnel and activities for which the Federal Government now contracts and Mr. Heyman would seem to be quite critical of these contracts with "private" institutions.

Mr. Heyman points out that the Government will never be able to attain the knowledge and experience to perform

its assigned functions with civil service and military personnel if it contracts for them every time new needs arise. He speaks, for example, of the danger of Government dependence on its "think group" contractors such as RAND. The price of this dependence is, he believes, high because of the resulting inflexibility and because the incentive to efficiency in most contracted operations is quite small.

Inasmuch as the advanced stages of research and development mesh with the early stages of production, it is becoming increasingly more difficult for Government to make research and development and production assignments to different contractors. The risk of conflicts of interest is substantial and inefficiency results.

Although Mr. Heyman's article discloses a number of interesting and critical relationships between Government and private contractors, no very feasible alternative is presented. The author overlooks proposing appropriate criteria for the Government to apply in determining when it should contract for services and when it should not. His central thesis—that the effectiveness and efficiency of private contracting should be questioned and examined—is undoubtedly well taken and a number of Congressional Committees have already evidenced rather considerable interest in these arrangements.

Knopp, Lawrence A. "The Buy American Act: A Review and Assessment," *Columbia Law Review*, 61 (Mar. 1961), 430-462.

The Buy American Act in the last decade has created a number of intense controversies as a result of its patent conflict with United States international trade policies. On the one hand, the United States has attempted to reduce and eliminate trade discrimination, and on the other, it has engaged in these very practices by virtue of this act. The act prohibits Federal agencies from procuring from foreign sources for use within the United States unless the head of the procuring agency determines that domestic procurement is inconsistent with the public interest or that the domestic cost is unreasonable. The "unreasonable cost" exception is of special significance in the practical administration of the act; if domestic competition exists, this exception provides the only basis on which a foreign supplier can hope to obtain a contract.

The act does not attempt to define what domestic cost differentials are unreasonable. Consequently, since the inception of the act in 1934, agencies have established their own criteria in order that the act might be workable. Over a period of years, a 25 per cent differential between domestic and foreign bids has come to be the controlling standard. In recent years, agencies and President Eisenhower's Randall Commission both attempted to reduce the differential in order that competitive conditions might again prevail but the levels of foreign procurement continue abnormally low. Mr. Knopp believes that the case for full and unconditional repeal of the act is overwhelming: The act is in conflict with long-standing United States trade policies; it saddles the government with extra costs; and, finally, it is conducive to international embarrassment and strain.

Morin, Desmond B. J. "The Purchasing Function," *The Canadian Chartered Accountant*, 79 (Oct. 1961) 346-352.

Stating that the purchasing function has not always received emphasis commensurate with its importance, Mr. Morin points out that now 72 per cent of the industrial purchasing agents in the United States report to either the vice-president of administration, the executive vice-president or the president. To be most effective, Mr. Morin holds, this major function must coordi-

nate with—and not be subordinate to—sales, engineering and production. Ten years ago the number of purchasing agents reporting to production executives was 25 per cent; this number has now been reduced to 10 per cent.

Mr. Morin's article does not attempt to describe the sophisticated techniques and many useful programs by which a purchasing staff can contribute to the management function. Nevertheless it does provide an excellent model of a well-conducted and effectively functioning purchasing department. Discussion of centralized purchasing, the organization for purchasing, the securing of bids and reporting to management renders the article valuable as a practical guide. The types of information of most interest to management are stated to be purchasing department operating costs, dollar value of purchases, cash discounts, inventory variations and turnover, data pertaining to waste, scrap and salvage disposal, and a written analytical summary. The article deals with problems encountered in practice in obtaining and preparing this information.

Out-moded buying methods are gradually being replaced by efficient departments vested with full authority for procurement. Mr. Morin is very much aware of this trend and conveys a sense of urgency to his readers.

Weinwurn, George F. "Computer Management Control Systems Through the Looking Glass," *Management Science*, 7 (July 1961), 411-419.

Practical considerations need to be emphasized in the design of electronic data processing equipment. The overall capabilities of a computerized executive control complex should be viewed in the light of the compromises inherent in establishing a going system. Mr. Weinwurn's discussion uses experience acquired in the design and operation over the past few years of SAGE (Semi-Automatic-Ground-Environment military system) as a frame of reference.

Consideration is given to the relative effectiveness with which SAGE communicates with its environment, the necessary compromises in the definition of the rules by which the system functions, and the corresponding difficulties that are to be expected in developing executive control systems.

In addition to his description of the evolution of SAGE, Mr. Weinwurn makes an important contribution by delineating the criteria that are essential in designing and programming effective systems. He thus establishes a foundation for subsequent realization of computer potentiality.

McEachron, W. D. "Profitability Index in Investment Evaluation," *The Comptroller*, 29 (Oct. 1961), 475-484.

Mr. McEachron views the investment decision as comprising four distinct but interrelated steps. "Conception," which refers to the creative perception phase, precedes the other steps. Secondly, "estimation" is required. The concept is brought into focus by defining and measuring the economic factors relating to the project. For example, operating costs, savings and revenue increments must be projected into the future. Next, "evaluation" condenses the various economic projections into one or more single-valued measures of over-all economic attractiveness. Finally, the "decision" step itself embraces all the quantitative economic factors that have been developed plus the intangible risk factors that necessarily must be considered. Mr. McEachron describes all four steps in detail but places primary emphasis on the "estimation" phase.

Essentially Mr. McEachron's article is a general summary of capital budget-

ing techniques including, for example, present value determination and the ranking of projects on the basis of profitability. It attempts to "speak" to the decision-maker "in his own language" but is so weighted with illustrations and examples that the objective may not be fully realized. In any event the reader is left to evolve a profitability index for himself. The greatest value of the article lies in its summary of the rudiments of decision ranking and making and in the examples cited to explain their importance.

OTHER ARTICLES OF INTEREST

Bach, G. Leland. "Accounting Education for the 1980's," *The Journal of Accountancy*, 112 (Sept. 1961), 50-54.

Mr. Bach emphasizes the importance of preparing accounting students to remain flexible as accounting techniques undergo transformation. It is not enough to become skilled in existing procedures—the accountant of tomorrow requires more general and less technical training today.

Barker, Richard B. "Dollar Value LIFO and the Klein Chocolate Case," *The Journal of Accountancy*, 112 (Sept. 1961), 41-45.

"The effort to obtain workable Treasury regulations on dollar-value inventory was paralleled by litigation in the case of Klein Chocolate Company, the only case decided in this particular area. The story of this litigation and the lengthy discussions before regulations were finally issued is a significant exemplification of problems in the relationships between tax accounting and generally accepted accounting principles."

Booth, H. C. "Widening the Internal Audit Horizon," *The Internal Auditor*, 18 (Oct. 1961), 48-59.

The management importance of carefully considering the cost of internal audits is emphasized. The important question to be resolved is whether the end product of the audit justifies the cost involved, since the purpose of internal audits is to assure the proper functioning of the instruments of control in operation in the organization. The idea of widening the scope of internal auditing can come from either management or the auditor, but when the auditor develops new lines of investigation, management should determine the extent to which the new internal auditing activities are justifiable.

Hillier, Paul W. "Fraud Controls," *The Internal Auditor*, 18 (Summer 1961), 16-23.

An inclusive and properly administered system of internal control is the most effective deterrent against employee theft, which now runs about one billion dollars a year. Mr. Hillier describes the elements of control and the respective control techniques employed by Price, Waterhouse and Co. In addition, he presents and critically evaluates a number of actual cases of fraud.

Journal Staff. "How the IRS Is Handling Accounting Questions at the Agent and Audit Level Today," *The Journal of Taxation*, 15 (Oct. 1961), 194-208.

The recent experiences of a number of prominent tax lawyers and accountants are used to indicate how the Internal Revenue Service's treatment of accounting methods, its correction of errors and its examination of inventory methods and valuation are changing.

Kunkler, David L. "Fixed Depreciation and Flexible Dollars," *National Accounting Association Bulletin*, 42 (Aug. 1961), Section I, 25-33.

"Common-dollar" adjustments to depreciation charges are advocated and their application illustrated in an article which maintains that:

> "if consistently applied, common-dollar depreciation will allocate properly the real cost, which is the historical cost adjusted to meet the changing price level. The equality of the annual depreciation charges will be in terms of the purchasing power of the dollar, not in the number of dollars. The result is that depreciation charges will be expressed in the same unit of measure as the other income and expense accounts in the operating statement."

Lewis, Charles A., Jr. "Loan Applications to the Small Business Administration," *The Journal of Accountancy*, 112 (Oct. 1961), 65-70.

The elements required in a loan application to the Small Business Administration are discussed and suggestions made as to the most effective manner of presenting the proposal. Inclusion of a narrative description of personal histories is advised.

Morse, Ellsworth H., Jr. "GAO Audits of Management Performance," *The Journal of Accountancy*, 112 (Oct. 1961), 42-48.

The Director of the Accounting and Auditing Policy Staff in the General Accounting Office describes the elements and objectives of a General Accounting Office audit and explains that these audits are required by law to be considerably more thorough than the usual financial audit.

Savage, Charles I. "Accounting News and Trends," *The New York Certified Public Accountant*, 31 (Sept. 1961), 581-583.

Early this year the CPA-Banker Research Institute of Texas was organized to determine how well accounting practices are serving bankers in Texas and since then it has sampled the accountants reports submitted to 70 Texas banks. Many of these reports were found to be inaccurate or otherwise inadequate, causing the Institute to conclude that lack of knowledge or insufficient fees were responsible for a large portion of the discrepancies and inadequacies. Many bankers felt they needed additional information—in many instances data available to the accountant but which he failed to include in his report.

Scully, V. M. T. "Translating Financial Data for Nonfinancial Executives," *The Comptroller*, 29 (Sept. 1961), 65-69.

Pointing out that advances in accounting concepts and techniques in recent decades have made accounting more incomprehensible to nonfinancial executives, Mr. Scully urges financial specialists to develop a language, outlook and attitude others can understand and accept. In a particularly helpful article, he discusses a number of financial concepts, such as capital expenditure evaluation, manufacturing-cost concepts and sales pricing, and suggests appropriate techniques of language and presentation.

Welsch, Glenn A. "Budgeting for Management Planning and Control," *The Journal of Accountancy*, 112 (Oct. 1961), 37-42.

In an article which reevaluates the purpose of budgeting in management, Professor Welsch states that the data in budget reports often suggest a precision which in fact budgets may lack. The primary function of a budget is to

assist management in planning and controlling and a budget therefore is merely a *guide* to action. The forward view may not be exact and deviations from the forecast should be expected and accounted for in budget application. The article also presents some of the more significant principles applicable to budget preparation and general guides for budget evaluation and usage.

PAMPHLETS

Advisory Commission on Intergovernmental Relations, *Local Nonproperty Taxes and the Coordinating Role of the State* (Commission Report No. 9), Washington, D. C.: Advisory Commission on Intergovernmental Relations, 1961, 68 pp. no charge.

This report is the first on state-local tax relations and the ninth in a series designed to help solve common problems confronting Federal, state and local governments. It points out that the civil government in the nation last year cost $63 billions, more than half of which took place at local levels, slightly more than a quarter at state levels and only 18 per cent at the Federal level.

Indicative of the trend at local level, the study states that local expenditures have increased from $6.5 billions in 1940 to $34 billions in 1960 and are now nearing $40 billions. To meet these rising expenditures, the $33 billions of local revenues available for general government came 48 per cent from property taxes, 30 per cent from state and Federal aid, 15 per cent from non-tax sources, and 7 per cent from non-property taxes. Despite record yields from all their taxes, local governments still were able to raise only 70\ cents from local sources for every dollar they spent last year.

Local governments are turning increasingly to consumer, income and excise taxes. These taxes, the Commission found, are poorly suited for local use except by the large cities. They distort competitive business relationships between neighboring communities, handicap local business firms in competing with firms beyond the city line and are costly for taxpayers to comply with and for governments to collect.

The specific recommendations submitted by the Commission are directed towards:

- Providing cities and adjoining jurisdictions in large metropolitan areas with uniform taxing powers and authority for cooperative tax enforcement
- Authorizing the addition of local tax supplements to state sales, income and excise taxes where these are used both by the state and a large number of local governments
- Permitting pooled administration of similar local taxes levied by numerous local governments
- Limiting local governments to the more productive taxes and discouraging the smaller jurisdictions from excessive tax diversity
- Providing state technical assistance to local tax authorities, including tax information, training facilities for local personnel, access to state tax records, and where appropriate, using sanctions against state taxpayers who fail to comply with local tax requirements.

Bureau of the Budget, *Management Improvement in the Executive Branch,* Washington, D. C.: U. S. Government Printing Office, 1961. 52 pp. 25 cents.

This booklet, the first of a series of "management bulletins" planned to develop a broad understanding of some of the more successful practices found in Federal agencies, presents a highlight summary of progress during the past decade. It is based on findings from interviews of Bureau of the Budget examiners with 900 officials in 25 agencies during the fall of 1960. Agency accomplishments are used to illustrate the many benefits to be derived from strong executive direction and control, success in husbanding resources—manpower, financial and physical—and the most useful management improvement techniques.

Bureau of the Budget, *The 1962 Budget Review,* Washington, D. C.: U. S. Government Printing Office, 1961. 64 pp. 25 cents.

President Kennedy, in a statement to cabinet officers and other heads of major Government agencies that has been incorporated in this report, provides a preview of his 1963 budget in these words:

> In view of the prospective gains in the economy, it is my intention to propose a balanced budget for that year, barring extraordinary and unforeseen defense requirements. As you know, we can expect a substantial increase in revenues under existing tax laws in fiscal 1963, reflecting the economic recovery now taking place. However, it is already clear that expenditures for the military and other elements of our national security programs will necessarily rise next year. In these circumstances it will plainly be necessary to defer or limit increases in many programs which in more normal times would be thoroughly desirable, and to shift present staffs and resources to the maximum extent from work of lower to work of higher priority. I will appreciate your cooperation in putting these policies into effect in planning the 1963 budget.

Changes in 1962 budget estimates are discussed in the Inside Government Department of this issue of THE FEDERAL ACCOUNTANT.

Department of Defense, *COBOL—1961: Revised Specifications for a COmmon Business Oriented Language (COBOL) for Programming Electronic Digital Computers,* Washington, D. C.: U. S. Government Printing Office, 1961. 258 pp. illustrated. $1.25.

This report is a technical reference manual detailing the current specifications of COBOL. It was prepared by a Special Task Group composed of representatives of 11 computer manufacturers, plus representatives of users in industry and the Federal Government, and represents an updating of the initial COBOL specifications published in May of 1960. The use of COBOL-61 for programming "business-type data processing problems" on computers is expected to assist materially in effective and economical utilization of electronic digital computers, by reducing the time and cost of programming efforts.

The 1961 revision eliminates ambiguities found in the initial specifications during a year of use and experience and adds a number of features not included in the initial version. Of particular interest is a table indicating that 15 computer manufacturers will develop "compilers" for 36 different models of computers. These "compilers" convert or translate the computer program written in English-language COBOL into the specific code or "machine language" of a particular make and model of computer.

In the foreword to COBOL-61, the Assistant Secretary of Defense (Comptroller) states that within the Department of Defense COBOL-61 shall be the preferred language for use in programming for problems classed as business data processing and its use in other areas is strongly encouraged. The Department of Defense recently issued a directive requiring that the availability of a COBOL compiler be considered as a factor in the selection of equipment, unless it can be shown that the intended application would not benefit from the use of COBOL. COBOL has achieved wide acceptance by computer users in private industry as well as in the Federal Government and several large firms have adopted it as their standard programming language.

BOOK REVIEWS

Anderson, David R. and Leo A. Schmidt. *Practical Controllership.* Homewood, Ill.: Richard D. Irwin, Inc., 1961. 777 pp. $10.65.

"Practical Controllership" is a comprehensive survey of controllership concepts and practices and of their application to forward planning, the importance of which is best expressed in the authors' own words:

> . . . the experience of many leading businesses would indicate that, while it may be more difficult to reduce forward planning to an organized pattern, it is *just that, more difficult*—not impossible, and certainly not unnecessary. It is the feeling of the authors that the greatest and most important developments in controllership in the foreseeable future will be the recognition of this problem and its reduction to systematic organized terms.

The diverse responsibilities assigned to controllership personnel are recognized but the authors hold that the really essential duties of controllership are all aspects of one basic function—"designing and operating the records of the business and reporting and interpreting the information they contain." The authors are of the opinion that when the full implications of this basic function are properly developed, the resulting concept of controllership will be both comprehensive and useful. Currently, they find the controllership concept is in a state of evolution and this is reflected in variations in controllership organizational patterns that are ascribed to (1) variations in businesses, (2) poorly coordinated additions, shifts and changes in a business organization, and (3) varied interpretations of the limits of the controller's function.

In their view the two greatest problems of controllership are those of control and venture measurement. With the division of the management organization into many units and subunits, it has become vitally necessary to measure the performance of each organization unit. Hence the authors properly emphasize the relating of data and account classifications to specific areas of individual responsibility. They advocate organizing the functional operations of the controller to synchronize with organizational entities

and internal management report categories insofar as practical. Venture measurement techniques are discussed under the general categories of The Accounting Plan, Manufacturing Costs, Direct Costing, Marketing and Administrative Costs, Inventory Control, Inventory Valuation, Depreciation Policy and Methods, and Statements and Reports for Management.

The material on inventory control is of particular interest. Inventory operating and accounting procedures are reviewed in a manner that clearly delineates between major policy considerations and the more detailed techniques of control. The authors note that usage rates and obsolescence may be disclosed by appropriate data processing methods but that neither these or any other methods can ever solve the basic problem of preplanning, for which human judgment and imagination remain necessary.

The chapters devoted to management reporting are highlighted by well organized illustrative data and exhibits, which relate appropriately to each other and to the text. In these chapters the basic reporting requirements are covered in an easily understood manner and emphasis is given to variance analysis, thoroughly landmarked with cautionary remarks concerning its limitations (see, for example, page 403). The authors believe that trend and control data should be reflected in separate presentations in order to afford proper exposure for absorption of report content or message.

Controllers in government will probably find the first five chapters—on functions and organization—and the last two chapters—on forward planning and how to attack specific problems—of greatest interest. They would do well also to make Chapter 4, The Controller and the Management Function, available to their management colleagues for background reading in this area.

JOHN C. JEFFERS
Systems Accountant
Navy Department

Eisenstein, Louis. *The Ideologies of Taxation.* New York: Ronald Press, 1961. 268 pp. $5.00.

Mr. Eisenstein's publishers recommend this book to "everyone who pays taxes and is skeptical about the justice of his share." With a potential market of this size, the returns to the author ought to be handsome indeed, which would please the Treasury Department as well as Mr. Eisenstein. For, having written rather than invented the source of his royalties, the author will be taxed thereon at ordinary rather than capital gain rates.

The lack of a sound basis for such distinctions in the Internal Revenue Code is the thesis developed in the book. The author's survey of our present method of allocating the income tax burden among our citizens causes him to conclude that little progress has been made in developing an equitable system since the passage of the Sixteenth Amendment. Correct or not, this rather pessimistic view has an honorable ancestry, as is witnessed by the lament of Plato, "When there is an income tax, the just man will pay more and the unjust less on the same amount of income."

Examination of the principal ideologies which are reflected in current tax law reveals to the author two groups of taxpayers whose influence has been widely felt: (1) those who advocate stimulation of the economy through lowering of the progressive rates, particularly on business and investment income, and (2) those who believe in taxation according to ability to pay. The rather cynical conclusion is drawn that progressive tax rates represent little more than an attack by the poor upon their well-heeled but outnumbered fellow citizens. Similarly, the many exceptions from the high progressive rates permitted in the name of economic progress are viewed mainly

as sophisticated maneuverings by the rich to protect their position of privilege against the onslaughts of the poor.

Equity is a concept which requires that persons similarly situated be similarly taxed. However, when the author examines the concept in action, he finds that it is often invoked to justify the expansion of special privileges so that more taxpayers have an equal chance to avoid their fair share of taxes. He also scrutinizes the background of many particular provisions of the tax law; for example, executive stock options, the special dispensation granted to Louis B. Mayer of movie fame, and dividend exclusions and credits. The rationale of capital gains is explored and percentage depletion merits a special chapter.

Careful marshalling of the arguments for and against many controversial features of our tax law is the outstanding feature of the book. In compiling these arguments the author shows a broad acquaintance with the significant literature on the economic aspects of taxation and the ability to summarize theories with clarity and precision. His selection of those theories which have exerted the most influence demonstrates the good judgment which comes with expertise in his chosen field. The workings of the Congressional system which produces our tax legislation is pointed up by revealing anecdotes. The book is readable (considering the topic) and even humorous at times.

The reader of the book must not expect to find therein positive solutions to the problems exposed in our tax system. Ideologies of taxation are explained but not endorsed. The author's conclusion is self-described as "restrained" and consists mainly of a plea for further education of voters and congressmen in matters of taxation. He does not take the opportunity to recommend the system proposed by Swift's political projector of the Academy at Lagado, who would impose the highest tax upon men who are the greatest favourites of the other sex, "and the assessments, according to the number and nature of the favours they have received; for which they are allowed to be their own vouchers."

Such a noted economist as Senator Paul H. Douglas of Illinois describes the book as "a well-written and ironic analysis of the contradictions in our tax laws and of the group pressures which have warped our revenue system." Although the author's seeming reluctance to propound a more positive thesis is disappointing, his volume constitutes an able analysis of the historical development and logical imperfections of theories of taxation widely held at the present time. As such, it is a valuable addition to the libraries of those concerned with the subject of taxation.

RICHARD PERKINS
Tax Attorney
Department of Justice

Gillespie, Cecil M, *Accounting Systems, Procedures and Methods*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc. 1961. 641 pages. $12.00.

Professor Gillespie's new volume on accounting systems provides a most commendable compendium of systems concepts. It represents a major revision of the 1950 edition which has long been regarded as preeminent in the general systems field. As might be expected, this new revision retains all of the major advantages of the first edition —principally its lucid presentation, its thoroughly practical approach, its emphasis on step-by-step procedures, its wealth of detail, its balanced coverage of the systems field, and its careful integration of internal control considerations with other aspects of systems design. Improvements achieved over the first edition consist of a simplified organization, electronic data processing coverage and a substantial updating generally.

This outstandingly organized volume

is divided into seven sections: How to Make the Survey, Methods, Systems and Procedures, Cost Systems, Reports, Punched-Card Accounting and Electronic Data-Processing. Integrated data processing concepts are emphasized throughout the different sections and systems considerations are evolved in the context of the newer machine methods. Many of the more recent machine models are illustrated, along with specially designed and standard forms for procedures encompassing all of the basic activities of a business organization. Most of these procedures are directly applicable to the governmental environment and the complete systems approach advocated by Professor Gillespie has many supporters within the Federal Government.

Each chapter dealing with procedures covers the function served by the procedure, the organizational elements typically involved in the procedure, the kinds of management information the procedures should provide, the accounting control and internal check features that should be considered in designing the procedure, and operations and methods applicable. The basic aim is to show how to design a procedure for any organization while presenting forms and methods plans the designer can use in solving the problem on which he is working.

Three chapters each on punched-card and electronic accounting provide a reasonably balanced treatment of these subjects within the limitations of space feasible in a general systems volume, although the chapters on electronic accounting are somewhat more technically oriented than the reviewer would recommend. These six chapters provide basic coverage of concepts and methods and are adequate to indicate the trend of developments in accounting and office automation.

The commendable excellence of this volume marks it as one to be included in the personal library of every professional accountant.

EDWIN J. B. LEWIS
Consultant in Accounting and Financial Management Systems
Washington, D.C.

Lesikar, Raymond V. *Report Writing for Business.* Homewood, Ill.: Richard D. Irwin, Inc., 1961. 337 pp. $9.25.

This excellent book will be of value not only to those who are concerned with *writing* reports for *business* but also to those who are concerned with almost any aspect of reports in almost any field—business, government, education, science, journalism, sociology or any other field where the communication of selected information and ideas is important. The term "reports" is used here and in the book in a broad sense to include types of communications that are not ordinarily called "reports" but go by such names as "memoranda," "briefs," "digests," "studies," "articles," "papers" and "manuals."

The author is Professor and Head of the Department of Management and Marketing, Louisiana State University. Although his underlying purpose in preparing this volume was to provide a text book for use in formal courses in business management, he has done his job so well that the volume is of value as a guide and reference work even for those who have had long experience in preparing reports or acting on reports.

The book should be of interest especially to those who are concerned with learning basic principles and techniques that underlie the preparation and use of reports of many different kinds; determining what factors need to be included in specific reports of various kinds; collecting information for specific reports by means of various research methods; analyzing information and selecting parts to be used in specific reports; organizing information and writing reports; illustrating reports with graphs, charts, tables, etc.; documenting reports; editing reports; and evaluating reports received from subordinates and, in the capacity of a superior

charged with such responsibilities, approving, disapproving or otherwise acting on them.

Besides comprehensive discussion of principles and techniques involved in various processes of report-making, the book contains a number of other features that the reader will find of value. These include:

(1) A 14-page bibliography, annotated, of books, periodicals and other publications, including government publications, arranged under five headings: (a) Accounting, (b) Finance, (c) General Business and Economics, (d) Management and (e) Marketing. One of the 13 periodicals included among the 26 publications listed under Accounting is THE FEDERAL ACCOUNTANT, with an annotation showing that it is published quarterly by the Federal Government Accounting (sic) Association, Washington, D. C., and that it "Presents articles pertaining to accounting theory and practice in governmental auditing and accounting." Another is *The Journal of Accountancy*, which according to the annotation, "Presents a wide selection of timely articles in all areas of accounting. Includes theoretical as well as practical works."

(2) Frequent references throughout the book to defects often found in reports, with specific suggestions for avoiding or correcting them.

(3) A 7-page check list which will be of service not only in preparing reports but in evaluating them or in grading them for academic purposes.

(4) A 5-page index.

(5) Type and format that make the book easy to read and use.

Although the title and parts of the first few pages of the book are addressed particularly to college students and teachers of business management, even top executives might find it well worth their while to take a look at this volume and to put a copy where members of their organization could use it. As a small stockholder I know of several companies listed on the stock exchanges whose report-makers ought to read this book.

JAMES E. MANGUM
Colonel, Retired,
U. S. Army Reserve,
Adjutant General's Corps

Washington, D. C.

Whyte, William Foote. *Men at Work*. Homewood, Ill.: The Dorsey Press, Inc., and Richard D. Irwin, Inc. 1961. 593 pp. $10.60.

To the literature currently available on the subject, Dr. Whyte has added an illuminating and thorough study of organizational relations in the business community. *Men at Work*, one of a series of Irwin-Dorsey publications on behavioral science in industry, approaches the subject of human relations in industry by examining the experience of individuals, groups and organizations from a sociological standpoint. The case studies and analyses Dr. Whyte presents should be of aid to high-level management personnel in recognizing trouble areas in their organizations, and of perhaps even more value, provide a wealth of suggestions for correcting organizational and personnel difficulties.

Dr. Whyte's central theme is his concept of "interaction." By this he means the interplay of actions and activities directed toward the individual by others in the course of his work. These actions and activities arising out of the employment environment, and the sentiments which the worker brings to his employment, operate to influence his attitude toward his job, his work group and the organization as a whole. The various ways in which these factors influence worker attitudes are explored in a series of illustrative case studies. Dr. Whyte uses these cases to demonstrate that an increase in the activities and actions directed toward the worker by his supervisors or the immediate

work group can bring about a significant and sometimes startling change in the performance of the individual, as well as in that of the group and the organization as a whole.

The individual in the employment environment is the subject of thorough study. In each of the seven parts into which the volume is divided, such as The Managerial Process (Part V) and Service, Staff and Control Activities (Part VI), the focal point is always the individual, the group or the organization as it acts or is acted upon by the individual. According to Dr. Whyte,

> The individual does not meet the organization alone. Whether he is at the work level or is a member of management, he is likely to fit into some group. His adjustment to the organization will be influenced by his group membership. The functioning of the organization will be influenced by the behavior of the groups within it.

After surveying various management methods in some detail, Dr. Whyte concludes that an official's attitudes toward his own staff and other personnel in the organization largely determine his effectiveness in the organization. The most effective manager tends to be the one most skilled in operating directly on the interactions and activities of his subordinates. How to do this to best advantage is carefully developed in the illustrative cases.

Management personnel would do well to read this informative study of factors which tend to influence the employee and his ever-changing attitude to his superiors and his job.

RICHARD CRAMER
Assistant Editor,
The Federal Accountant
Washington, D. C.

LOOKING AHEAD

Progress in career development underscores the need for greater mobility in the career service—for a break with the tradition of career advancement in ever-narrowing specialization. That pattern is appropriate for highly technical occupations and professions, but it is utterly inadequate for the development of the qualities of perspective, breadth of understanding, and responsiveness to public demands, that are so essential in career managers and executives. We must deliberately cultivate mobility, both within the Government and between Government and private employment.

. . . Civil Service Chairman Macy in addressing the Regional Federal Personnel Management Conference in Kansas City, Missouri on October 23, 1961.

Reader Opinion

Association members and readers generally are invited to submit short communications expressing their opinions, or giving information, on any matter appearing in THE FEDERAL ACCOUNTANT *or otherwise within the province of the Association. Statements that do not exceed 300 words are most suitable and all must bear the writer's name and address. The editors reserve to themselves the right to select the communications or excerpts therefrom which they will publish and to reject others. They are not responsible for matters stated or views expressed in any communication.*

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UNACHIEVED GOALS?

I think . . . . [Mr. Lewis'] . . . . article in the September Issue is an excellent statement of what FGAA and THE FEDERAL ACCOUNTANT should be. I only wish my experience didn't indicate that both fall quite a bit short of those goals.

Reference was made in the article to passive membership. From my own personal experience and from conversations with other relatively inactive members, I have been forced to the conclusion that, knowingly or not, the primary purpose of the Association and the journal is to promote the specific recommendations of the Second Hoover Commission. Having spent 15 of my 25 years of experience at field station level and having spent 5 of those 15 years in trying unsuccessfully to make two budget and accounting systems built on the same principles work, I cannot join enthusiastically in the promotion of these recommendations. I am convinced of their impracticability.

I do feel that it is possible the divergence of FGAA and THE FEDERAL ACCOUNTANT from the announced target of providing for free interchange of ideas is an unconscious result of their actions rather than a planned end, but either way, this is the result. Insofar as the basic principles upon which Federal accounting systems must be based are concerned, I am forced to the conclusion that FGAA and THE FEDERAL ACCOUNTANT are actually being devoted to the "free interchange" of only a *single* idea.

ERLE CATO

Falls Church, Virginia

► *Mr. Cato's forthright expression of his views is welcomed by the editors. His letter above to Mr. Lewis was not written for publication and he acceded to its publication only upon strong urging from the editors.* THE FEDERAL ACCOUNTANT *has not been without shortcomings and not all of its goals were fully achieved during the past decade, the first of its existence. To the fullest possible extent, however, the editors are resolved to do everything within their capabilities to meet the highest standards of professional journalism. Your editors are individually and collectively determined that any shortcomings to be found will have occurred*

only because their best efforts were not entirely adequate to the high standards to which THE FEDERAL ACCOUNTANT *aspires.*

"REGRET AND/OR DISAPPOINTMENT"

My purpose in writing this letter is to express *regret and/or disappointment* over the apparent lack of interest in appropriate reading material on Federal Government accounting practices for non-professional personnel, of which I am one. Many of us in the management field find it impossible to agree that the current lack of management-oriented material need continue.

Government manuals with their legalistic and technical financial language do not and cannot meet the need of personnel who have not had professional accounting education. Although I do not know very many of the talented members of your association it should be relatively easy to select an editor for a readable book on Federal Government Accounting: Mr. Raymond Einhorn, an accounting expert with commensurate talents in communicating ideas. My acquaintance with Mr. Einhorn's talents comes primarily from his work for the Financial Management Roundtable and his speeches at various meetings of the Society for the Advancement of Management. He has a broad approach to accounting principles and a rare ability to communicate clearly to both accounting and non-accounting professional groups. He would make an excellent choice for a readable volume on Federal Government Accounting.

As for THE FEDERAL ACCOUNTANT, I would rate it a useful publication for keeping up with new developments and applications and for exposing oneself to new approaches or ideas. It cannot, however, have more than merely a supplemental role in relation to the much-needed coordinated volume on Federal Government Accounting. Perhaps you might do well to consider publishing a series of supplements, each dealing with a particular area of accounting. In the long run these supplements could add up to something like the coordinated volume I am advocating—at least they would be better than nothing.

RICHARD H. CHAPMAN
Washington, D. C.

► *The question raised here is one of deep concern to all interested in the advancement and improvement of Federal financial management. A number of universities offer specialized courses in this field but most such courses seem to be oriented towards those having at least some professional education in accounting.*

FROM OTHER ASSOCIATIONS

An exchange subscription to STATE GOVERNMENT is being entered for you, effective with the Summer Issue which came off the press last month. We are sure that THE FEDERAL ACCOUNTANT will be of distinct value to us.

FRANK SMOTHERS
Director of Publications
Council of State Governments
Chicago, Illinois

• • • •

We are pleased to accept your offer of an exchange of THE FEDERAL ACCOUNTANT with our monthly PUBLIC MANAGEMENT. I am sure we will find your periodical useful in the research and reference work we do in this office.

DAVID S. ARNOLD
Publications Director
The International City Managers' Association
Chicago, Illinois

► *Several dozen similar letters were received from other professional associations with whom a publications exchange agreement has been arranged.*

. . . . AND FROM EL SALVADOR

. . . . The Central Accounting Department, an agency of the Ministry of Finance of this country, is also interested in subscribing to THE FEDERAL ACCOUNTANT. I would appreciate hearing from you relative to the terms of such a subscription.

ALEJANDRO SANCHEZ ORELLANO
San Salvador, Republica de
El Salvador, C. A.

► *Applicable foreign rates are $6.00 for the first subscription and $5.00 for each additional subscription to the same address.*

BOUQUETS

I feel much better about the future of THE FEDERAL ACCOUNTANT after reading your encouraging letter of October 10, 1961.

ARCH ROUNSAVILLE
Dallas, Texas

* * * *

Permission is requested to reproduce and distribute to our staff two articles appearing in the September Issue of THE FEDERAL ACCOUNTANT:

"Government Experience as a Qualification for the CPA Certificate," by Norman Burton.

"The Auditor's Contribution to Organization and Control in Data-Processing Program," by Joseph J. Guidrey.

The material contained in these two articles is of high professional value to our staff and would benefit them greatly. Distribution of the reprints will be made to our regional audit office staffs in New York, San Francisco, Miami and Washington, as well as our central office staff.

I would like this opportunity to commend the Editors of THE FEDERAL ACCOUNTANT for the splendid content of the September Issue.

HARLEY R. CLIMPSON
Civil Aeronautics Board
Washington, D. C.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, JULY 2, 1946 AND JUNE 11, 1960 (74 STAT. 208) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

The Federal Accountant, published Quarterly at Washington, D. C., for September 20, 1961.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:
   Publisher, Federal Government Accountants Association, Washington, D. C.
   Editor, Edwin J. B. Lewis, Washington, D. C.
   Managing editor, None
   Business manager, Martin C. Powers, Washington, D. C.

2. The owner is:
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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: 4,200.

MARTIN C. POWERS
(Signature of business manager)

Sworn to and subscribed before me this 28th day of September, 1961.

ALICE O. REDPEARN
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